

APPENDIX I

Tualatin River Subbasin Water Quality Management Plan (WQMP)



Prepared by: Oregon Department of Environmental Quality
August, 2001



Submissions by:

- Oregon Dept. of Forestry
- Oregon Dept. of Agriculture
- Unified Sewerage Agency
- City of Portland
- City of West Linn
- City of Lake Oswego
- Multnomah County
- Clackamas County
- Washington County

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<u>CHAPTER 1 - INTRODUCTION</u>	1
<u>CHAPTER 2 - TMDL WATER QUALITY MANAGEMENT PLAN GUIDANCE</u>	4
<u>CHAPTER 3 – CONDITION ASSESSMENT AND PROBLEM DESCRIPTION</u>	4
3.1 GEOGRAPHIC REGION OF INTEREST	4
3.2 BENEFICIAL USES	5
3.3 CURRENT CONDITIONS	5
3.4 EXISTING SOURCES OF WATER POLLUTION	6
3.4.1 Dissolved Oxygen	6
3.4.2 Phosphorus	7
3.4.3 Bacteria	8
3.4.4 Temperature	9
<u>CHAPTER 4 – GOALS AND OBJECTIVES</u>	9
<u>CHAPTER 5 - IDENTIFICATION OF RESPONSIBLE PARTICIPANTS</u>	10
<u>CHAPTER 6 – PROPOSED MANAGEMENT MEASURES</u>	13
<u>CHAPTER 7 – TIMELINE FOR IMPLEMENTATION</u>	17
<u>CHAPTER 8 – REASONABLE ASSURANCE</u>	18
NPDES and WPCF Permit Programs	18
NONPOINT SOURCES	19
THE OREGON PLAN	21
VOLUNTARY MEASURES	21
Landowner Assistance Programs	22
<u>CHAPTER 9 – MONITORING AND EVALUATION</u>	22
TRACKING IMPLEMENTATION	23
<u>CHAPTER 10 – PUBLIC INVOLVEMENT</u>	23
<u>CHAPTER 11 – COSTS AND FUNDING</u>	23
POTENTIAL SOURCES OF PROJECT FUNDING	23
<u>CHAPTER 12 – CITATION TO LEGAL AUTHORITIES</u>	24
CLEAN WATER ACT SECTION 303(D)	24
NPDES AND WPCF PERMIT PROGRAMS	24
OREGON ADMINISTRATIVE RULES	25
OREGON FOREST PRACTICES ACT	25
SENATE BILL 1010	25
LOCAL ORDINANCES	26
<u>CHAPTER 13 - IMPLEMENTATION AND ADAPTIVE MANAGEMENT ISSUES</u>	26
ADAPTIVE MANAGEMENT	27

APPENDIX 1 – DEPARTMENT OF FORESTRY	29
APPENDIX 2 – DEPARTMENT OF AGRICULTURE	41
APPENDIX 3 - USA	46
APPENDIX 4 - PORTLAND.....	51
APPENDIX 5 – WEST LINN	56
APPENDIX 6 – LAKE OSWEGO	59
APPENDIX 7 – MULTNOMAH COUNTY.....	64
APPENDIX 8 – CLACKAMAS COUNTY	68
APPENDIX 9 – WASHINGTON COUNTY	73

CHAPTER 1 - INTRODUCTION

This document is intended to describe strategies for how the Tualatin River Subbasin Total Maximum Daily Loads (TMDLs) will be implemented and, ultimately, achieved. The main body has been prepared by the Oregon Department of Environmental Quality (ODEQ) and includes a description of activities, programs, legal authorities, and other measures for which ODEQ and the subbasin's designated management agencies (DMAs) have regulatory responsibilities. This Water Quality Management Plan (WQMP) is the overall framework describing the management efforts to implement the Tualatin River Subbasin TMDLs. Appended to this document are DMA-specific Implementation Plans which describe each DMA's existing or planned efforts to implement their portion of the TMDLs. This relationship is presented schematically in **Figure 1**, below.

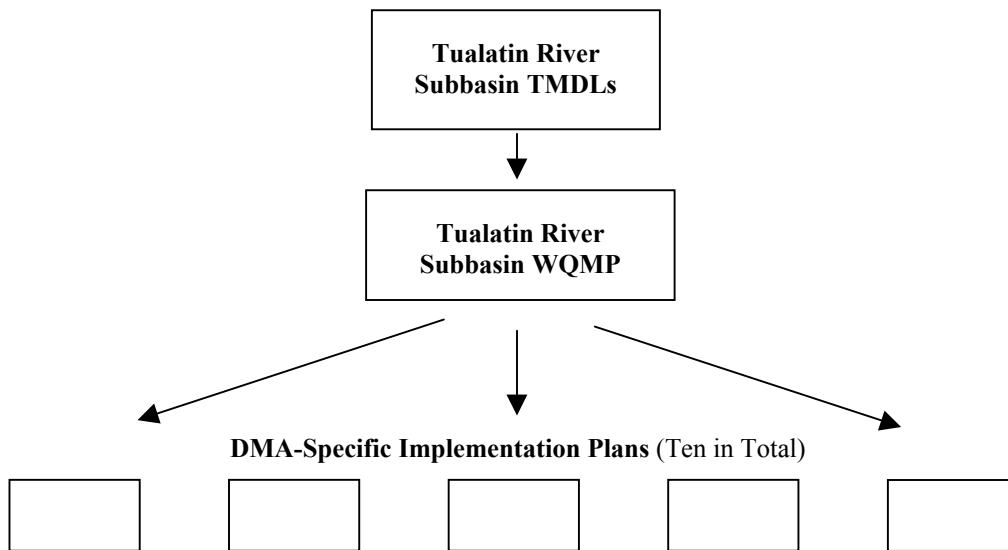


Figure 1 : TMDL/WQMP/Implementation Plan Schematic

The DMAs named in the Tualatin River Subbasin TMDLs have submitted preliminary Implementation Plans that are appended to this document. These Implementation Plans, when complete, are expected to fully describe DMA efforts to achieve their appropriate allocations, and ultimately, water quality standards. Since the DMAs will require some time to fully develop these Implementation Plans once the TMDLs are finalized, the first iteration of the Implementation Plans are not expected to completely describe management efforts.

ODEQ recognizes that TMDL implementation is critical to the attainment of water quality standards. Additionally, the support of DMAs in TMDL implementation is essential. In instances where ODEQ has no direct authority for implementation, it will work with DMAs on implementation to ensure attainment of the TMDL allocations and, ultimately, water quality standards. Where ODEQ has direct authority, it will use that authority to ensure attainment of the TMDL allocations (and water quality standards).

This document is the first iteration of the Water Quality Management Plan (WQMP) for the new and revised Tualatin River Subbasin TMDLs. As explained in "Element 6" of this document, DMA-specific Implementation Plans will be more fully developed once the current TMDLs are submitted to the U. S. Environmental Protection Agency (EPA) and approved. Currently, the DMAs have proposed timelines (following final TMDL approval) to develop full Implementation Plans. ODEQ and the DMAs will work cooperatively in the development of the TMDL Implementation Plans and ODEQ will assure that the plans adequately address the elements described below under "TMDL Water Quality Management Plan

Guidance". In short, this document is a starting point and foundation for the WQMP elements being developed by ODEQ and Tualatin River Subbasin DMAs.

The goal of the Clean Water Act and associated Oregon Administrative Rules (OARs) is that water quality standards shall be met or that all feasible steps will be taken towards achieving the highest quality water attainable. This is a long-term goal in many watersheds, particularly where non-point sources are the main concern. To achieve this goal, implementation must commence as soon as possible.

TMDLs are numerical loadings that are set to limit pollutant levels such that in-stream water quality standards are met. ODEQ recognizes that TMDLs are values calculated from mathematical models and other analytical techniques designed to simulate and/or predict very complex physical, chemical and biological processes. Models and techniques are simplifications of these complex processes and, as such, are unlikely to produce an exact prediction of how streams and other waterbodies will respond to the application of various management measures. It is for this reason that the TMDL has been established with a margin of safety.

WQMPs are plans designed to reduce pollutant loads to meet TMDLs. ODEQ recognizes that it may take some period of time - from several years to several decades - after full implementation before management practices identified in a WQMP become fully effective in reducing and controlling pollution. In addition, ODEQ recognizes that technology for controlling nonpoint source pollution is, in many cases, in the development stages and will likely take one or more iterations to develop effective techniques. It is possible that after application of all reasonable best management practices, some TMDLs or their associated surrogates cannot be achieved as originally established.

ODEQ also recognizes that, despite the best and most sincere efforts, natural events beyond the control of humans may interfere with or delay attainment of the TMDL and/or its associated surrogates. Such events could be, but are not limited to, floods, fire, insect infestations, and drought.

In the Tualatin River Subbasin TMDLs, pollutant surrogates have been defined as alternative targets for meeting the TMDLs for some parameters. The purpose of the surrogates is not to bar or eliminate human access or activity in the basin or its riparian areas. It is the expectation, however, that this WQMP and the associated DMA-specific Implementation Plans will address how human activities will be managed to achieve the surrogates. It is also recognized that full attainment of pollutant surrogates (system potential vegetation, for example) at all locations may not be feasible due to physical, legal or other regulatory constraints. To the extent possible, the Implementation Plans should identify potential constraints, but should also provide the ability to mitigate those constraints should the opportunity arise. For instance, at this time, the existing location of a road or highway may preclude attainment of system potential vegetation due to safety considerations. In the future, however, should the road be expanded or upgraded, consideration should be given to designs that support TMDL load allocations and pollutant surrogates such as system potential vegetation.

If a non-point source that is covered by the TMDLs complies with its finalized Implementation Plan or applicable forest practice rules, it will be considered in compliance with the TMDL.

ODEQ intends to regularly review progress of this WQMP and the associated Implementation Plans to achieve TMDLs. If and when ODEQ determines that the WQMP has been fully implemented, that all feasible management practices have reached maximum expected effectiveness and a TMDL or its interim targets have not been achieved, the Department shall reopen the TMDL and adjust it or its interim targets and the associated water quality standard(s) as necessary.

The implementation of TMDLs and the associated plans is generally enforceable by ODEQ, other state agencies and local government. However, it is envisioned that sufficient initiative exists to achieve water quality goals with minimal enforcement. Should the need for additional effort emerge, it is expected that the responsible agency will work with land managers to overcome impediments to progress through education, technical support or enforcement. Enforcement may be necessary in instances of insufficient

action towards progress. This could occur first through direct intervention from land management agencies (e.g. ODF, ODA, counties and cities), and secondarily through ODEQ. The latter may be based on departmental orders to implement management goals leading to water quality standards.

If a source is not given a load allocation, it does not necessarily mean that the source is prohibited from discharging any wastes. A source may be permitted to discharge by ODEQ if the holder can adequately demonstrate that the discharge will not have a significant impact on water quality over that achieved by a zero allocation. For instance, a permit applicant may be able to demonstrate that a proposed thermal discharge would not have a measurable detrimental impact on projected stream temperatures when site temperature is achieved. Alternatively, in the case where a TMDL is set based upon attainment of a specific pollutant concentration, a source may be permitted to discharge at that concentration and still be considered as meeting a zero allocation.

Adaptive Management

In employing an adaptive management approach to the TMDLs and the WQMP, ODEQ has the following expectations and intentions:

- Subject to available resources, on a five-year basis, ODEQ intends to review the progress of the TMDLs and the WQMP.
- In conducting this review, ODEQ will evaluate the progress towards achieving the TMDLs (and water quality standards) and the success of implementing the WQMP.
- ODEQ expects that each DMA will also monitor and document its progress in implementing the provisions of its Implementation Plan. This information will be provided to ODEQ for its use in reviewing the TMDL.
- As implementation of the WQMP and the associated Implementation Plans proceeds, ODEQ expects that DMAs will develop benchmarks for attainment of TMDL surrogates, which can then be used to measure progress.
- Where implementation of the Implementation Plans or effectiveness of management techniques are found to be inadequate, ODEQ expects management agencies to revise the components of their Implementation Plan to address these deficiencies.
- When ODEQ, in consultation with the DMAs, concludes that all feasible steps have been taken to meet the TMDL and its associated surrogates and attainment of water quality standards, the TMDL, or the associated surrogates is not practicable, it will reopen the TMDL and revise it as appropriate. ODEQ would also consider reopening the TMDL should new information become available indicating that the TMDL or its associated surrogates should be modified.

CHAPTER 2 - TMDL WATER QUALITY MANAGEMENT PLAN

GUIDANCE

In February 2000, ODEQ entered into a Memorandum of Agreement (MOA) with the U.S. Environmental Protection Agency (EPA) that describes the basic elements needed in a TMDL Water Quality Management Plan (WQMP). These elements, as outlined below, will serve as the framework for this WQMP.

WQMP Elements

1. Condition assessment and problem description
2. Goals and objectives
3. Identification of responsible participants
4. Proposed management measures
5. Timeline for implementation
6. Reasonable assurance
7. Monitoring and evaluation
8. Public involvement
9. Costs and funding
10. Citation to legal authorities

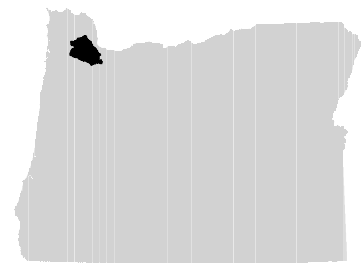
This Tualatin River Subbasin WQMP is organized around these plan elements and is intended to fulfill the requirement for a management plan contained in OAR 340-041-0745.

CHAPTER 3 – CONDITION ASSESSMENT AND PROBLEM

DESCRIPTION

3.1 Geographic Region of Interest

The Tualatin River Subbasin is a 712 square-mile area situated west of the Portland metropolitan area in northwestern Oregon. The subbasin is roughly oval shaped and is bounded by the Coast Range on the west, the Tualatin Mountains on the east and north, and the Chehalem Mountains on the south. The Tualatin River originates in the Coast Range Mountains and flows eastward approximately 80 miles to the Willamette River. Home to over 320,000 people, the subbasin is approximately 50% forested, 35% farmland, and 15% urbanized. Most of the land in the Tualatin River Subbasin is privately owned, with private timberland in the higher elevations and private agriculture and livestock operations at lower elevations in the subbasin. Major cities and towns located within the subbasin include Beaverton, Forest Grove, Hillsboro, Tigard, and Tualatin.



The Tualatin River has five (5) major tributaries and numerous minor tributaries. Gales Creek flows through a mixed forested and agricultural landscape, whereas Dairy Creek flows through

predominantly agricultural lands. Rock Creek has both agricultural and urban influences, and Fanno Creek flows almost exclusively through urban areas. Since 1975, Tualatin River streamflow has been augmented during the summer months with water releases from Henry Hagg Lake, a man-made reservoir on Scoggins Creek. Water from Henry Hagg Lake is primarily used for irrigation, but the Unified Sewerage Agency of Washington County (USA) utilizes approximately 12,000 acre feet for summertime flow augmentation. Currently, releases are designed to meet a flow target of 150 cubic feet per second (cfs) at river mile (RM) 33.3. Before Henry Hagg Lake was constructed, summer flows often dropped well below 50 cfs at RM 33.3.

The physical characteristics of the Tualatin River vary dramatically from the headwaters to the mouth. The headwater reach, from RM 79.4 to 55.3, shows characteristics of a classic mountain stream – narrow channel, several waterfalls, and steep (74 feet per mile) gradient. Once the river reaches the valley floor, the slope decreases dramatically and the river begins to meander. This meandering reach (RM 55.3 to 33.3) has an average slope of only 1.3 feet per mile. Downstream of the meandering reach, the river flows into a meandering, reservoir-like reach (RM 33.3 to 3.4) with a slope of approximately 0.8 feet per mile. The reservoir-like characteristics of the lower Tualatin are caused both by a very low natural gradient and the Oswego low-head diversion dam located at RM 3.4. From the Oswego diversion dam to the confluence with the Willamette River the gradient increases to 13 feet per mile. These physical characteristics are important factors in determining the river's water quality because they affect the river's reaeration rate, the hydraulic residence time, and the amount of solar radiation reaching the water.

3.2 Beneficial Uses

Oregon Administrative Rules (OAR Chapter 340, Division 41, Table 6) lists the “Beneficial Uses” occurring within the Tualatin River Subbasin (**Table 1**). Numeric and narrative water quality standards are designed to protect the most sensitive beneficial uses.

Table 1. Beneficial uses occurring in the Tualatin River Subbasin (OAR 340 – 41 – 0442)			
<i>Beneficial Use</i>	<i>Occurring</i>	<i>Beneficial Use</i>	<i>Occurring</i>
Public Domestic Water Supply	✓	Salmonid Fish Spawning (Trout)	✓
Private Domestic Water Supply	✓	Salmonid Fish Rearing (Trout)	✓
Industrial Water Supply	✓	Resident Fish and Aquatic Life	✓
Irrigation	✓	Anadromous Fish Passage	✓
Livestock Watering	✓	Wildlife and Hunting	✓
Boating	✓	Fishing	✓
Hydro Power	✓	Water Contact Recreation	✓
Aesthetic Quality	✓		

3.3 Current Conditions

The Tualatin River Subbasin has stream segments listed on the 1998 Oregon 303(d) List for: temperature, bacteria, dissolved oxygen, chlorophyll *a*, toxics (arsenic, iron and manganese), biological criteria and high pH. Total Maximum Daily Loads (TMDLs) were established in 1988 for ammonia and phosphorus to address low dissolved oxygen and elevated pH and chlorophyll *a* in the mainstem. ODEQ has revised these TMDLs and has developed new TMDLs to address the more recently added parameters.

There have been significant water quality improvements in the mainstem Tualatin due to the implementation of management activities designed to address the ammonia and phosphorus TMDLs. The dissolved oxygen and pH standards in the mainstem have been met most of the time in recent years. These improvements reflect reduced ammonia and phosphorus loadings from wastewater treatment plants, managing releases from Hagg Lake for water quality purposes and initiating implementation of non-point controls of agricultural and urban runoff.

The ammonia and phosphorus TMDLs have been modified to better address new information that has been gathered since 1988 based on Tualatin Basin Policy Advisory Committee recommendations to ODEQ. New TMDLs have been developed for temperature, bacteria and dissolved oxygen (to address low dissolved oxygen in the tributaries due to sediment oxygen demand). The focus of the new TMDLs is primarily on the tributaries of the Tualatin River with the exception of temperature, which is subbasin-wide.

Concerns due to habitat and flow modification (identified under biological criteria standard exceedance) will be addressed in management plans put together by management agencies. Exceedance of arsenic, iron and manganese standards were identified as being due to the natural geochemical environment and regional groundwater hydrology and most likely reflect natural background conditions. Low pH values measured at selected sites were called into question due to questionable quality assurance. These waters are poorly buffered (low stream alkalinity) making pH measurements difficult. In addition, soils are acidic, rainwater is slightly acidic and there are no known sources in the watershed. TMDLs will not be established for these parameters.

3.4 Existing Sources of Water Pollution

3.4.1 Dissolved Oxygen

Ammonia

Ammonia has been identified in the dissolved oxygen (DO) TMDL as a pollutant leading to low DO levels in the mainstem Tualatin River. During the summer and fall, when dissolved oxygen levels may reach critical levels due to nitrification, the major sources of ammonia are the two USA summer discharging wastewater treatment plants: Durham (RM 9.3) and Rock Creek (RM 38.0). Other sources of ammonia within the subbasin are considered relatively insignificant.

Volatile Solids

The DO TMDL also identified volatile (organic) solids as a pollutant for DO on both the mainstem Tualatin River and the tributary streams. Probable volatile solid sources in the subbasin include:

- **Urban Runoff**
- **Rural Runoff**
- **Agricultural Runoff**
- **Forestry Runoff**
- **Instream and near-stream erosion**
- **Algal Detritus**

(This listing is not meant to be comprehensive, but it does contain the most probable sources of volatile solids in the subbasin).

3.4.2 Phosphorus

The primary anthropogenic sources of total phosphorus in the Tualatin River Subbasin are the following (this listing is not meant to be comprehensive, but it does contain the most probable sources in the subbasin):

1. Wastewater Treatment Plants and Sanitary Sewer Systems

Two of the four wastewater treatment plants (WWTPs) in the subbasin, Durham and Rock Creek, discharge during the phosphorus TMDL period. Wasteload allocations have been assigned to both of these plants. Sanitary sewer system overflows during this season are typically minimal during the TMDL period.

2. Cross connections

Cross connections between sanitary and storm sewer systems are common and can be a significant source of bacteria loading during both wet and dry weather.

3. Permitted Sites other than POTWs

Discharges from other permitted sites (industrial, etc.) may contain phosphorus either in stormwater runoff or in direct discharges.

4. Urban Runoff

Urban runoff can be quite high in total phosphorus concentrations. The ultimate sources could include fertilizers, erosion, cross-connections, etc.

5. Rural Runoff

Rural runoff may contain phosphorus from the same sources as urban runoff, with the possible exception of sanitary sewers. Additional potential sources are “hobby” farms, horse pastures, and ranchettes. These sites are often stocked very densely and may have poor management. The density of septic systems is usually relatively high in rural areas and therefore the possibility of failing systems is also quite high.

6. Agricultural Runoff

Some of the potential sources of phosphorus in agricultural runoff are fertilizers, animal waste, and erosion.

7. Forestry Runoff

Since surface runoff in forested areas during the TMDL season is expected to be minimal, phosphorus loads from forestry operations during are most likely predominately associated with roads and culverts.

8. Failing Septic Systems

Effluent from failing septic systems will contain phosphorus, along with bacteria, BOD and other pollutants.

9. Instream and Near-stream Erosion

Phosphorus contained in soils may be transported to the critical segments of the Tualatin River through instream and near-stream erosion. While a certain amount of this erosion is natural, some erosion (especially during the summer), is not natural.

3.4.3 Bacteria

The following is a listing of possible bacteria sources in the subbasin. This listing is not meant to be comprehensive, but it does contain the most probable sources of bacteria in the subbasin.

1. Wastewater Treatment Plants and Sanitary Sewer Systems

There are four wastewater treatment plants in the subbasin: Durham, Rock Creek, Hillsboro and Forest Grove. Both Durham and Rock Creek discharge year-round, while Hillsboro and Forest Grove do not discharge during the summer. The bacteria discharge limits on each of the plants is well below the criteria and therefore they generally have a diluting effect on bacteria concentrations. A possible exception to this is during overflow or bypass situations. A bypass would result in higher bacteria concentrations at the plant's normal outfall, whereas overflows (upsets) could occur at almost any place within the sewerage system. System operators are required to report bypasses and sewer system upsets. Records will be reviewed to determine their number, extent and impacts.

2. Cross connections

Cross connections between sanitary and storm sewer systems are common and can be a significant source of bacteria loading during both wet and dry weather.

3. Permitted Sites other than POTWs

Discharges from other permitted sites (industrial, etc.) may contain bacteria in either stormwater or direct discharges. These permits will be reviewed to determine this potential.

4. Direct Deposition

Bacteria may be directly deposited into surface waters by birds and other animals. This is most evident in ponds where high temperatures, low velocities and high bird densities often result in elevated bacteria concentrations.

5. Illegal Dumping

The illegal dumping of wastes either to storm sewer systems or directly to surface waters is a potential bacteria source. This dumping may be of portable toilet wastes, recreational vehicle wastes, etc.

6. Urban Runoff

Instream bacteria values in urban watersheds can be very high during runoff events. Data from stormwater sampling points to urban runoff as a significant source of bacteria in surface waters. The ultimate sources of this bacteria are most likely multiple and may include:

- Pet and other animal waste
- Illegal dumping
- Failing septic systems
- Sanitary sewer cross-connections and overflows

7. Rural Runoff

Rural runoff may contain bacteria from the same sources as urban runoff, with the possible exception of sanitary sewers. Additional potential sources are "hobby" farms, horse pastures and ranchettes. These sites are often stocked very densely and may have poor management. The density of septic systems is usually relatively high in rural areas and therefore the possibility of failing systems is also quite high.

8. Agricultural Runoff

The primary source of bacteria in agricultural runoff is most likely animal waste. This animal waste may be from livestock grazing in pasture, inappropriate waste management practices, faulty waste systems, etc. (Direct discharges from confined animal feeding operations (CAFOs) are prohibited in Oregon).

3.4.4 Temperature

Surface water temperatures in Tualatin River Subbasin are heavily influenced by human activities. These activities are diverse and may have either a detrimental or a beneficial impact on river temperature. Some of these activities have an readily observable and direct impact on water temperature, such as cool water releases from reservoirs, while other activities may have a less observable impact, such as the loss of riparian vegetation (shading), water withdrawal and the disconnection of floodplains to rivers.

Riparian vegetation, stream morphology, hydrology, climate, and geographic location influence stream temperature. While climate and geographic location are outside of human control, the condition of the riparian area, channel morphology and hydrology can be affected by land use activities. Specifically, elevated summertime stream temperatures attributed to anthropogenic sources may result from the following conditions within the Tualatin River Subbasin:

1. Riparian vegetation disturbance that reduces stream surface shading, riparian vegetation height, and riparian vegetation density (shade is commonly measured as percent effective shade),
2. Channel widening (increased width to depth ratios) due to factors such as loss of riparian vegetation that increases the stream surface area exposed to energy processes, namely solar radiation,
3. Reduced flow volumes (from irrigation, industrial, and municipal withdrawals) or increased high temperature discharges, and
4. Disconnected floodplains which prevent/reduce groundwater discharge into the river.

CHAPTER 4 – GOALS AND OBJECTIVES

The overall goal of the TMDL Water Quality Management Plan (WQMP) is to achieve compliance with water quality standards for each of the 303(d) listed parameters and streams in the Tualatin River Subbasin. The specific goal of this WQMP is to describe a strategy for reducing discharges from nonpoint sources to the level of the load allocations and for reducing discharges from point sources to the level of the waste load allocations described in the TMDL. As discussed above, this plan is preliminary in nature and is designed to be adaptive as more information and knowledge is gained regarding the pollutants, allocations, management measures, and other related areas.

Specific objectives that will lead to the overall goal include:

1. Develop Best Management Practices (BMPs) to achieve Load Allocations and Wasteload Allocations;
2. Give reasonable assurance that management measures will meet load allocations - through both quantitative and qualitative analysis of management measures;
3. Adhere to measurable milestones for progress;
4. Develop a timeline for implementation, with reference to costs and funding;
5. Develop a monitoring plan to determine if:
 - a. BMPs are being implemented
 - b. Individual BMPs are effective
 - c. Load and wasteload allocations are being met
 - d. Water quality standards are being met

CHAPTER 5 - IDENTIFICATION OF RESPONSIBLE PARTICIPANTS

The purpose of this element is to identify the organizations responsible for the implementation of the plan and to list the major responsibilities of each organization. What follows is a simple list of those organizations and responsibilities. This is not intended to be an exhaustive list of every participant that bears some responsibility for improving water quality in the Tualatin River Subbasin. Because this is a community wide effort, a complete listing would have to include every business, every industry, every farm, and ultimately every citizen living or working within the subbasin. We are all contributors to the existing quality of the Tualatin River and we all must be participants in the efforts to improve the river.

Oregon Department of Environmental Quality

- NPDES Permitting and Enforcement
- WPCF Permitting and Enforcement
- Technical Assistance
- Financial Assistance

Oregon Department of Agriculture

- Agricultural Water Quality Management Plan Development, Implementation & Enforcement.
- CAFO Permitting and Enforcement
- Technical Assistance
- Revise Agricultural WQMAP
- Rules under Senate Bill (SB) 1010 to clearly address TMDL and Load Allocations as necessary.
- Riparian area management

Oregon Department of Forestry

- Forest Practices Act (FPA) Implementation
- Conservation Reserved Enhancement Program
- Revise statewide FPA rules and/or adopt subbasin specific rules as necessary.
- Riparian area management

Oregon Department of Transportation

- Construction, operation and maintenance of State-owned roadways, bridges, etc.

Unified Sewerage Agency

- Construction, operation and maintenance of four wastewater treatment plants and sanitary sewer system
- Construction, operation and maintenance of most of the municipal separate storm sewer system in Washington County and within the urban growth boundary (UGB).
- Permitting of stormwater quality facilities
- Riparian area management

Cities of Portland, West Linn, Lake Oswego

- Construction, operation, and maintenance of the municipal separate storm sewer system within the city limits.
- Land use planning/permitting
- Maintenance, construction and operation of parks and other city owned facilities and infrastructure
- Riparian area management

Washington, Clackamas and Multnomah Counties

- Construction, operation and maintenance of County roads and county storm sewer system.
- Land use planning/permitting
- Maintenance, construction and operation of parks and other county owned facilities and infrastructure
- Inspection and permitting of septic systems
- Riparian area management

Table 2, below, shows Tualatin River Subbasin 303d listed stream segments along with the responsible Designated Management Agencies

Table 2. Geographic Coverage of Designated Management Agencies

Stream	Segment	TMDL Parameters	Designated Management Agencies
Ash Creek	Mouth to Headwaters	Bacteria, Biological Criteria, DO, Temperature	Mult, Port, USA
Beaverton Creek	Mouth to Headwaters	Bacteria, Biological Criteria, DO, Temperature	Mult, Port, USA
Bronson Creek	Mouth to Headwaters	Bacteria, Biological Criteria, DO, Temperature, Chlorophyll a	Mult, Port, USA
Burris Creek	Mouth to Headwaters	Bacteria, Biological Criteria, DO, Temperature	ODA, ODF, Wash
Butternut Creek	Mouth to Headwaters	Bacteria, Biological Criteria, DO, Temperature	ODA, USA, Wash
Carpenter Creek	Mouth to Headwaters	Bacteria (summer), DO,	ODA, ODF, Wash
Cedar Creek	Mouth to Headwaters	Bacteria, DO, Chlorophyll a	ODA, ODF, USA, Wash
Chicken Creek	Mouth to Headwaters	Bacteria, DO	Clack, ODA, ODF, USA, Wash
Christenson Creek	Mouth to Headwaters	Bacteria, DO	ODA, ODF, Wash
Council Creek	Mouth to Headwaters	DO	ODA, USA, Wash
Dairy Creek	Mouth to East/West Forks	Bacteria, Temperature	ODA, ODF, USA, Wash
E Fork Dairy Creek	Mouth to Whiskey Cr.	pH (summer), Temperature	ODA, ODF, Wash
W Fork Dairy Creek	Mouth to Headwaters	Bacteria (summer), DO, Temperature	ODA, ODF, Wash
Fanno Creek	Mouth to Headwaters	Bacteria, DO, Temperature, Chlorophyll a, Toxics	Clack, LO, Mult, USA
Gales Creek	Mouth to Clear Creek	Bacteria (summer), DO, Temperature	ODA, ODF, USA, Wash
Gales Creek	Clear Creek to Headwaters	pH (fall, winter, spring)	ODF
Hall Creek	Mouth to Headwaters	Bacteria, DO	USA
Heaton Creek	Mouth to Headwaters	Bacteria	ODA, ODF, Wash
Hedges Creek	Mouth to Headwaters	Bacteria, Biological Criteria, DO, Temperature	USA
Johnson Creek – North	Mouth to Headwaters	Bacteria, Temperature	Mult, USA
Johnson Creek – South	Mouth to Headwaters	Bacteria, Biological Criteria, DO, Temperature	USA
McFee Creek	Mouth to Headwaters	Bacteria, DO	ODA, ODF, Wash
McKay Creek	Mouth to East Fork	Bacteria, Temperature	ODA, ODF, USA, Wash
Nyberg Creek	Mouth to Headwaters	Bacteria, DO, Temperature, Chlorophyll a	Clack, USA
Rock Creek	Mouth to Headwaters	Bacteria, Biological Criteria, DO, Temperature, Chlorophyll a	Mult, ODA, ODF, Port, USA, Wash
Rock Creek – South	Mouth to Headwaters	Biological Criteria	Clack, ODA, USA, Wash
Scoggins Creek	Mouth to Hagg Lake	DO (November – April)	ODA, ODF, Wash
Summer Creek	Mouth to Headwaters	Bacteria, Biological Criteria, DO, Temperature	USA, Wash
Tualatin River	Mouth to Dairy Creek	DO (Ammonia), Chlorophyll a (Phosphorus), Bacteria, Temperature	Clack, LO, Mult, ODA, ODF, USA, Wash, WL
Willow Creek	Mouth to Headwaters	Bacteria, DO, Temperature	Port, Mult, USA
ODOT operates and maintains roadways, bridges, etc. in most of the 5 th field watersheds in the subbasin			

*Notes: DO = Dissolved Oxygen, DO is listed for May – Oct. unless otherwise noted, Temperature and Chlorophyll a are listed for Summer unless otherwise noted, Bacteria is listed year-round unless otherwise note

Clack = Clackamas Co. LO = City of Lake Oswego Mult = Multnomah Co. ODA= Oregon Dept. of Agriculture ODF = Oregon Dept. of Forestry
 ODOT = Oregon Dept. of Transportation USA = Unified Sewerage Agency Wash = Washington Co. WL = City of West Linn

CHAPTER 6 – PROPOSED MANAGEMENT MEASURES

This section of the plan outlines the proposed management measures that are designed to meet the wasteload allocations and load allocations of each TMDL. The timelines for addressing these measures are given in the following section.

For two of the TMDL parameters, temperature and bacteria, Oregon Administrative Rules (OAR) contain specific language regarding management plans. In particular, the language relating to temperature management plans reads (in part):

OAR 340-041-0026 - Policies and Guidelines Generally Applicable to All Basins

(3) (a) (D) Effective July 1, 1996, in any waterbody identified by the Department as exceeding the relevant numeric temperature criteria specified for each individual water quality management basin identified in ... OAR-340-041-0445, ... and designated as water quality limited under Section 303(d) of the Clean Water Act, the following requirements shall apply to appropriate watersheds or stream segments in accordance with priorities established by the Department. The Department may determine that a plan is not necessary for a particular stream segment or segments within a water-quality limited basin based on the contribution of the segment(s) to the temperature problem:

(i) Anthropogenic sources are required to develop and implement a surface water temperature management plan which describes the best management practices, measures, and/or control technologies which will be used to reverse the warming trend of the basin, watershed, or stream segment identified as water quality limited for temperature;

(ii) Sources shall continue to maintain and improve, if necessary, the surface water temperature management plan in order to maintain the cooling trend until the numeric criterion is achieved or until the Department, in consultation with the Designated Management Agencies (DMAs), has determined that all feasible steps have been taken to meet the criterion and that the designated beneficial uses are not being adversely impacted. In this latter situation, the temperature achieved after all feasible steps have been taken will be the temperature criterion for the surface waters covered by the applicable management plan. The determination that all feasible steps have been taken will be based on, but not limited to, a site-specific balance of the following criteria: protection of beneficial uses; appropriateness to local conditions; use of best treatment technologies or management practices or measures; and cost of compliance;

(iii) Once the numeric criterion is achieved or the Department has determined that all feasible steps have been taken, sources shall continue to implement the practices or measures described in the surface water temperature management plan in order to continually achieve the temperature criterion;

(iv) For point sources, the surface water temperature management plan will be part of their National Pollutant Discharge Elimination System Permit (NPDES);

(v) For nonpoint sources, the surface water temperature management plan will be developed by designated management agencies (DMAs) which will identify the appropriate BMPs or measures;

(vi) A source (including but not limited to permitted point sources, individual landowners and land managers) in compliance with the Department or DMA (as appropriate) approved surface water temperature management plan shall not be deemed to be causing or contributing to a violation of the numeric criterion if the surface water temperature exceeds the criterion;

The OAR language relating to bacteria management plans reads (in part):

OAR 340-041-0026 - Policies and Guidelines Generally Applicable to All Basins

(3) (a) (I) In waterbodies designated by the Department as water-quality limited for bacteria, and in accordance with priorities established by the Department, development and implementation of a bacteria management plan shall be required of those sources that the Department determines to be contributing to the problem. The Department may determine that a plan is not necessary for a particular stream segment or segments within a water-quality limited basin based on the contribution of the segment(s) to the problem. The bacteria management plans will identify the technologies, BMPs and/or measures and approaches to be implemented by point and nonpoint sources to limit bacterial contamination. For point sources, their National Pollutant Discharge Elimination System permit is their bacteria management plan. For nonpoint sources, the bacteria management plan will be developed by designated management agencies (DMAs) which will identify the appropriate BMPs or measures and approaches.

As the development of this WQMP and the associated DMA-specific Implementation Plans progresses, these rules will provide guidance for both point sources and nonpoint sources.

The management measures to meet the load and wasteload allocations may differ depending on the source of the pollutant. Given below is a categorization of the sources and a description of the management measures being proposed for each source category.

Wastewater Treatment Plants

The wasteload allocations given to the two wastewater treatment plants (WWTPs), Durham and Rock Creek, will be implemented through modifications to their National Pollutant Discharge Elimination System (NPDES) permits. These permits will either include numeric effluent limits or provisions to develop and implement management plans, whichever is appropriate.

General and Minor Individual NPDES Permitted Sources

All general NPDES permits and minor individual NPDES permits will be reviewed and, if necessary, modified to ensure compliance with allocations. Either numeric effluent limits will be incorporated into the permits or specific management measures and plans will be developed.

Other Sources

For discharges from sources other than the WWTPs and those permitted under general or minor NPDES permits, ODEQ has assembled an initial listing of management categories. This listing, given in **Table 3** below, is designed to be used by the designated management agencies (DMAs) as guidance for selecting management measures to be included in their Implementation Plans. Each DMA will be responsible for examining the categories in **Table 3** to determine if the source and/or management measure is applicable within their jurisdiction. This listing is not comprehensive and other sources and management measures will most likely be added by the DMAs where appropriate. For each source or measures deemed applicable a listing of the frequency and extent of application should also be provided. In addition, each of the DMAs is responsible for source assessment and identification, which may result in additional categories. It is crucial that management measures be directly linked with their effectiveness at reducing pollutant loading contributions.

Table 3. Management categories sorted by pollutant source and/or management measures

Management Measure/Source Category	Parameter				
	Bacteria	Temperature	Ammonia	Phosphorus	Volatile Solids
Public Awareness/Education	X	X	X	X	X
General Outreach					
Targeted Outreach					
New Development and Construction					
Planning Procedures		X		X	X
Permitting/Design		X		X	X
Education and Outreach		X		X	X
Construction Control Activities		X		X	X
Procedures/Measures					
Inspection/Enforcement					
Post-Construction Control Activities	X	X		X	X
Procedures/Measures					
Inspection/Enforcement					
Storm Drain System Construction					
Existing Development					
Storm Drain System					
O&M	X		X	X	X
Retrofit	X		X	X	X
Inlet					
Lines (Daylighting)					
Outfalls					
Water Quality Facilities					
Drainage Ditches					
Other					
Streets & Roads					
Street Sweeping	X		X	X	X
Maintenance Activities					X
Septic Systems	X		X	X	X
Procedures/Measures					
Inspection/Enforcement					
Parking Lots	X	X	X	X	X
Commercial and Industrial Facilities	X	X	X	X	X
Source Control					
Fertilizers			X	X	
Pet Waste	X			X	
Other					

Table 3 (Continued). Management categories sorted by pollutant source and/or management measures

Management Measure/Source Category	Parameter				
	Bacteria	Temperature	Ammonia	Phosphorus	Volatile Solids
Illicit Connections and Illegal Dumping					
Residential					
Illegal Dumping	X			X	X
Illicit Discharges and Cross Connections	X		X	X	X
Commercial and Industrial					
Illegal Dumping	X			X	X
Illicit Discharges and Cross Connections	X		X	X	X
Riparian Area Management					
Revegetation		X		X	X
Streambank Stabilization				X	X
Public/Governmental Facilities					
Parks	X		X	X	
Public Waterbodies (Ponds, etc.)	X				
Municipal Corporation Yard O&M	X	X	X	X	X
Other Public Buildings and Facilities	X	X	X	X	X
Forest Practices					
Riparian Area Management		X		X	X
Roads/Culverts				X	X
Agricultural Practices					
Riparian Area Management		X		X	X
Erosion Control				X	X
Animal Waste	X		X	X	X
CAFOs					
Other					
Nutrient Management			X	X	
Planning and Assessment	X	X	X	X	X
Source Assessment/Identification	X	X	X	X	X
Source Control Planning	X	X	X	X	X
Monitoring and Evaluation	X	X	X	X	X
BMP Monitoring and Evaluation	X	X	X	X	X
Instream Monitoring	X	X	X	X	X
BMP Implementation Monitoring	X	X	X	X	X

CHAPTER 7 – TIMELINE FOR IMPLEMENTATION

The purpose of this element of the WQMP is to demonstrate a strategy for implementing and maintaining the plan and the resulting water quality improvements over the long term. Included in this section are timelines for the implementation of ODEQ activities. Each DMA-specific Implementation Plan will also include timelines for the implementation of the milestones described earlier. Timelines should be as specific as possible and should include a schedule for BMP installation and/or evaluation, monitoring schedules, reporting dates and milestones for evaluating progress.

The DMA-specific Implementation Plans are designed to reduce pollutant loads from sources to meet TMDLs, associated loads and water quality standards. The Department recognizes that where implementation involves significant habitat restoration or reforestation, water quality standards may not be met for decades. In addition, the Department recognizes that technology for controlling nonpoint source pollution is, in some cases, in the development stages and will likely take one or more iterations to develop effective techniques.

In some Tualatin River Subbasin TMDLs, pollutant surrogates have been defined as alternative targets for meeting the TMDL for some parameters. The purpose of the surrogates is not to bar or eliminate human access or activity in the subbasin or its riparian areas. It is the expectation, however, that the Implementation Plans will address how human activities will be managed to achieve the surrogates. It is also recognized that full attainment of pollutant surrogates (site potential vegetation, for example) at all locations may not be feasible due to physical, legal or other regulatory constraints. To the extent possible, the Implementation Plans should identify potential constraints, but should also provide the ability to mitigate those constraints should the opportunity arise. For instance, at this time, the existing location of a road or highway may preclude attainment of system potential vegetation due to safety considerations. In the future, however, should the road be expanded or upgraded, consideration should be given to designs that support TMDL load allocations and pollutant surrogates such as system potential vegetation.

The Department intends to regularly review progress of the Implementation Plans. The plans, this overall WQMP, and the TMDLs are part of an adaptive management process. Modifications to the WQMP and the Implementation Plans are expected to occur on an annual or more frequent basis. Review of the TMDLs are expected to occur approximately five years after the final approval of the TMDLs, or whenever deemed necessary by ODEQ.

Figure 2, below, gives the timeline for activities related to the WQMP and associated DMA Implementation Plans (based on time following approval of the TMDL by EPA).

Figure 2: Water Quality Management Plan Timeline

Activity	Year 1		Year 2		Year 3		Year 4		Year 5	
ODEQ Modification of MS4 Permits										
ODEQ Modification of WWTP Permits										
ODEQ Modification of General and Minor Permits										
DMA Development and Submittal of Implementation and Monitoring Plans										
DMA Implementation of Plans										
ODEQ/DMA/Public Review of TMDL and WQMP										
DMA Submittal of Annual Reports	Sept. 30 of Each Year									

CHAPTER 8 – REASONABLE ASSURANCE

This section of the WQMP is intended to provide reasonable assurance that the WQMP (along with the associated DMA-specific Implementation Plans) will be implemented and that the TMDL and associated allocations will be met.

There are several programs that are either already in place or will be put in place to help assure that this WQMP will be implemented. Many of these programs were developed in response to the phosphorus and ammonia TMDLs developed in 1988. Some of these are traditional regulatory programs such as specific requirements under NPDES discharge permits. Other programs address non-point sources under the auspices of state law (for forested and agricultural lands) and voluntary efforts.

Point Sources

Reasonable assurance that implementation of the point source wasteload allocations will occur will be addressed through the revision, issuance or revision of NPDES and WPCF permits.

NPDES and WPCF Permit Programs

The ODEQ administers two different types of wastewater permits in implementing Oregon Revised Statute (ORS) 468B.050. These are: the National Pollutant Discharge Elimination System (NPDES) permits for surface water discharge; and Water Pollution Control Facilities (WPCF) permits for onsite (land) disposal. The NPDES permit is also a Federal permit, which is required under the Clean Water act for discharge of waste into waters of the United States. ODEQ has been delegated authority to issue NPDES permits by the EPA. The WPCF permit is unique to the State of Oregon. As the permits are renewed, they will be revised to insure that all 303(d) related issues are addressed in the permit. These permit activities assure that elements of the TMDL WQMP involving urban and industrial pollution problems will be implemented.

For point sources, provisions to address the appropriate waste load allocations (WLAs) will be incorporated into NPDES permits when permits are renewed by ODEQ, within 1 year after the EPA approves the TMDL. It is likely each point source will be given a reasonable time to upgrade, if necessary, to meet its new permit limits. A schedule for meeting the requirements will be incorporated into the permit. Adherence to permit conditions is required by State and Federal Law and ODEQ has the responsibility to ensure compliance.

The NPDES permits for the two wastewater treatment plants with wasteload allocations, Durham and Rock Creek, will be revised to address the WLAs. All general and minor NPDES permits within the subbasin will also be revised to address the appropriate WLAs.

NPDES municipal separate storm sewer (MS4) permits will also be revised to address the appropriate wasteload allocations. It is envisioned each MS4 permit within the Tualatin River Subbasin will be revised, reissued or issued with requirements that:

- A detailed implementation plan be prepared that presents reasonable assurance that their WLAs will be met.
 - The portion of the implementation plan addressing the WLAs is implemented in a timely fashion.
- The MS4 permits provisions will also need to address the pertinent OAR language pertaining to temperature and bacteria management plans (as described earlier in this document).

Nonpoint Sources

Forestry

The Oregon Department of Forestry (ODF) is the designated management agency for regulation of water quality on non-federal forest lands. The Board of Forestry has adopted water protection rules, including but not limited to OAR Chapter 629, Divisions 635-660, which describe BMPs for forest operations. These rules are implemented and enforced by ODF and monitored to assure their effectiveness. The Environmental Quality Commission, Board of Forestry, ODEQ, and ODF have agreed that these pollution control measures will be relied upon to result in achievement of state water quality standards. ODF provides on the ground field administration of the Forest Practices Act (FPA). For each administrative rule, guidance is provided to field administrators to insure proper, uniform and consistent application of the Statutes and Rules. The FPA requires penalties, both civil and criminal, for violation of Statutes and Rules. Additionally, whenever a violation occurs, the responsible party is obligated to repair the damage. For more information, refer to the Management Measures element of this Plan.

As described in the Department of Forestry's Implementation Plan (Appendix 1), ODF and DEQ are involved in several statewide efforts to analyze the existing FPA measures and to better define the relationship between TMDL load allocations and the FPA measures designed to protect water quality. How water quality parameters are affected, as established through the TMDL process as well as other monitoring data, will be an important part of the body of information used in determining the adequacy of the FPA.

As the DMA for water quality management on nonfederal forestlands, the ODF is also working with the ODEQ through a memorandum of understanding (MOU) signed in June of 1998. This MOU was designed to improve the coordination between the ODF and the ODEQ in evaluating and proposing possible changes to the forest practice rules as part of the Total Maximum Daily Load process. The purpose of the MOU is also to guide coordination between the ODF and ODEQ regarding water quality limited streams on the 303d list. An evaluation of rule adequacy will be conducted (also referred to as a "sufficiency analysis") through a water quality parameter by parameter analysis. This statewide demonstration of forest practices rule effectiveness in the protection of water quality will address the following specific parameters and will be conducted in the following order¹:

- 1) Temperature (estimated draft report target completion date Fall, 2000)
- 2) Sediment and turbidity (estimated date Fall, 2000)
- 3) Aquatic habitat modification (estimated date Fall, 2000)
- 4) Bio-criteria (estimated date Winter, 2001)
- 5) Other parameters (estimated date Summer, 2001)

These sufficiency analyses will be reviewed by peers and other interested parties prior to final release. The analyses will be designed to provide background information and techniques for watershed-based assessments of BMP effectiveness and water quality assessments for watershed with forest and mixed land uses. Once the sufficiency analyses are completed, they will be used as a coarse screen for common elements applicable to each individual TMDL to determine if forest practices are contributing to water quality impairment within a given watershed and to support the adaptive management process. See Appendix A for a more detailed description of Oregon Department of Forestry TMDL-related activities.

Currently ODF does not feel that adequate data exists to make a collective determination on the sufficiency of the current FPA BMPs in meeting water quality standards within the Tualatin River Subbasin. This situation most closely resembles the scenario described under condition c of the

¹ The estimated completion dates listed here differ from those dates listed in the MOU. Due to unforeseen circumstances the DEQ and ODF have agreed to revise the dates.

ODF/ODEQ MOU. Therefore, the current BMPs will remain as the forestry component of the TMDL. The draft versions of the statewide FPA sufficiency analyses for the various water quality parameters will be completed as noted above. The proposed Tualatin River TMDLs will be completed in the fall of 2000. Data from an ODF/ODEQ shade study will be collected over the summer of 1999 and a final report will be completed in the Fall of 2000. Information from the ad hoc committee advisory process may be available by Summer of 2000. Information from these efforts, along with other relevant information provided by the ODEQ, will be considered in reaching a determination on whether the existing FPA BMPs meet water quality standards within the Tualatin River Subbasin.

Agriculture

It is the Oregon Department of Agriculture's (ODA) statutory responsibility to develop agricultural water quality management (AWQM) plans and enforce rules that address water quality issues on agricultural lands. The AWQM Act directs ODA to work with local farmers and ranchers to develop water quality management area plans for specific watersheds that have been identified as violating water quality standards and having agriculture water pollution contributions. The agriculture water quality management area plans are expected to identify problems in the watershed that need to be addressed and outline ways to correct those problems. These water quality management plans are developed at a local level, reviewed by the State Board of Agriculture, and then adopted into the Oregon Administrative Rules. It is the intent that these plans focus on education, technical assistance, and flexibility in addressing agriculture water quality issues. These plans and rules will be developed or modified to achieve water quality standards and will address the load allocations identified in the TMDL. In those cases when an operator refuses to take action, the law allows ODA to take enforcement action. ODEQ will work with ODA to ensure that rules and plans meet load allocations.

Recognizing the adopted rules need to be quantitatively evaluated in terms of load allocations in the TMDL and pursuant to the June 1998 Memorandum of Agreement between ODA and ODEQ, the agencies will conduct a technical evaluation commencing in late 2000. The agencies will establish the relationship between the plan and its implementing rules and the load allocations in the TMDL to determine if the rules provide reasonable assurance that the TMDLs will be achieved. The AWQMA Local Advisory Committee (LAC) will be apprised and consulted during this evaluation. This adaptive management process provides for review of the AWQMA plan to determine if any changes are needed to the current AWQMA rules specific to the Tualatin River Subbasin.

Appendix B summarizes ODA's plans for addressing existing and future TMDLs.

Urban and Rural Sources

Reasonable assurance that load allocations from nonpoint sources in rural and urban areas are given within the DMA Implementation Plans included in the appendices. Each DMA has agreed to fully address the TMDL implementation process following the final approval of the TMDL by the USEPA. Please see Appendices A through I for a more detailed description of the course of action that Tualatin River Subbasin DMAs have agreed to take upon completion of the TMDLs.

Tualatin River Subbasin DMAs are expected to continue to provide reasonable assurance that TMDL-related management measures will be implemented and that they will result in meeting the load allocations set forth in the TMDLs. The reasonable assurance will be quantified as much as possible but may include narrative portions. This process will include a description of parameter-specific BMPs and an estimate of load reductions expected from implementing these activities. It is recognized that some sources do not lend themselves to quantification. This may be especially true of some nonpoint sources that have discharges that may not be readily monitored or estimated.

The Oregon Plan

The Oregon Plan for Salmon and Watersheds represents a major effort, unique to Oregon, to improve watersheds and restore endangered fish species. The Oregon Plan is a major component of the demonstration of “reasonable assurance” that this TMDL WQMP will be implemented.

The Plan consists of four essential elements:

Coordinated Agency Programs:

Many state and federal agencies administer laws, policies, and management programs that have an impact on salmon and water quality. These agencies are responsible for fishery harvest management, production of hatchery fish, water quality, water quantity, and a wide variety of habitat protection, alteration, and restoration activities. Previously, agencies conducted business independently. Water quality and salmon suffered because they were affected by the actions of all the agencies, but no single agency was responsible for comprehensive, life-cycle management. Under the Oregon Plan, all government agencies that impact salmon are accountable for coordinated programs in a manner that is consistent with conservation and restoration efforts.

Community-Based Action:

Government, alone, cannot conserve and restore salmon across the landscape. The Oregon Plan recognizes that actions to conserve and restore salmon must be worked out by communities and landowners, with local knowledge of problems and ownership in solutions. Watershed councils, soil and water conservation districts, and other grassroots efforts are vehicles for getting the work done. Government programs will provide regulatory and technical support to these efforts, but local people will do the bulk of the work to conserve and restore watersheds. Education is a fundamental part of the community based action. People must understand the needs of salmon in order to make informed decisions about how to make changes to their way of life that will accommodate clean water and the needs of fish.

Monitoring:

The monitoring program combines an annual appraisal of work accomplished and results achieved. Work plans will be used to determine whether agencies meet their goals as promised. Biological and physical sampling will be conducted to determine whether water quality and salmon habitats and populations respond as expected to conservation and restoration efforts.

Appropriate Corrective Measures:

The Oregon Plan includes an explicit process for learning from experience, discussing alternative approaches, and making changes to current programs. The Plan emphasizes improving compliance with existing laws rather than arbitrarily establishing new protective laws. Compliance will be achieved through a combination of education and prioritized enforcement of laws that are expected to yield the greatest benefits for salmon.

Voluntary Measures

There are many voluntary, non-regulatory, watershed improvement programs (Actions) that are in place and are addressing water quality concerns in the Tualatin River Subbasin. Both technical expertise and partial funding are provided through these programs. Examples of activities promoted and accomplished through these programs include: planting of conifers, hardwoods, shrubs, grasses and forbs along streams; relocating legacy roads that may be detrimental to water quality; replacing problem culverts with adequately sized structures, and improvement/ maintenance of legacy roads known to cause water quality problems. These activities have been and are being implemented to improve watersheds and enhance water quality. Many of these efforts are helping resolve water quality related legacy issues.

Landowner Assistance Programs

A variety of grants and incentive programs are available to landowners in the Tualatin River Subbasin. These incentive programs are aimed at improving the health of the watershed, particularly on private lands. They include technical and financial assistance, provided through a mix of state and federal funding. Local natural resource agencies administer this assistance, including the Oregon Department of Forestry, the Oregon Department of Fish and Wildlife, ODEQ, and the National Resources Conservation Service.

Field staff from the administrative agencies provide technical assistance and advice to individual landowners, watershed councils, local governments, and organizations interested in enhancing the subbasin. These services include on-site evaluations, technical project design, stewardship/conservation plans, and referrals for funding as appropriate. This assistance and funding is further assurance of implementation of the TMDL WQMP.

Financial assistance is provided through a mix of cost-share, tax credit, and grant funded incentive programs designed to improve on-the-ground watershed conditions. Some of these programs, due to source of funds, have specific qualifying factors and priorities. Cost share programs include the Forestry Incentive Program (FIP), Stewardship Incentive Program (SIP), Environmental Quality Incentives Program (EQIP), and the Wildlife Habitat Incentive Program (WHIP).

CHAPTER 9 – MONITORING AND EVALUATION

Monitoring will provide information on progress being made toward achieving TMDL allocations and achieving water quality standards. The information generated by each of the agencies/entities gathering data in the Tualatin River Subbasin will be pooled and used to determine whether management actions are having the desired effects or if changes in management actions and/or TMDLs are needed. If progress is not occurring then the appropriate management agency will be contacted with a request for action.

The objectives of this monitoring effort are to demonstrate long-term recovery, better understand natural variability, track implementation of projects and BMPs, and track effectiveness of TMDL implementation. This monitoring and feedback mechanism is a major component of the “reasonable assurance of implementation” for the Tualatin River Subbasin TMDL WQMP. There has been a significant monitoring program implemented within the subbasin since the development of the initial TMDLs in 1988. This has been a joint effort between the DMAs, ODEQ and the USGS. It is expected that this program will continue with modifications made, if necessary, to address the following areas:

1. Tracking of the implementation of specific management measures;
2. Monitoring of the effectiveness of specific management measures;
3. Monitoring of the effectiveness of the individual implementation plans in meeting the load and wasteload allocations;
4. Monitoring of the effectiveness of the TMDLs and implementation plans in meeting the water quality standards.

The ODF has a monitoring program that is currently coordinating separate projects to monitor the effectiveness of the forest practice rules with regard to landslides, riparian function, stream temperature, chemical applications, sediment from roads, BMP compliance, and shade. The results from some of these projects have been released in the form of final reports and other projects will have final reports available in the spring of 2000, 2001 and beyond.

Tracking Implementation

This WQMP and the DMA-specific Implementation Plans will be tracked by accounting for the numbers, types, and locations of projects, BMPs, educational activities, or other actions taken to improve or protect water quality. The mechanism for tracking DMA implementation efforts will be annual reports to be submitted to ODEQ.

The agricultural Implementation Plan is the Tualatin River Subbasin Agricultural Water Quality Management Area Plan developed by a local agricultural advisory committee under the authority of the Oregon Department of Agriculture (SB1010). To assist with tracking implementation, ODA or its local management agency will identify the number of farms and, to the extent possible, the number and types of BMPs to address water quality that were implemented to address water quality during the reporting period. ODA will also identify any relevant educational activities that took place during the reporting period.

CHAPTER 10 – PUBLIC INVOLVEMENT

To be successful at improving water quality a TMDL WQMP must include a process to involve interested and affected stakeholders in both the development and the implementation of the plan. In addition to the ODEQ public notice policy and public comment periods associated with TMDLs and permit applications, future Tualatin Subbasin TMDL public involvement efforts will focus specifically on urban, agricultural and forestry activities. DMA-specific public involvement efforts will be detailed within the Implementation Plans included in the appendices.

CHAPTER 11 – COSTS AND FUNDING

Designated Management Agencies will be expected to provide a fiscal analysis of the resources needed to develop, execute and maintain the programs described in their Implementation Plans.

The purpose of this element is to describe estimated costs and demonstrate there is sufficient funding available to begin implementation of the WQMP. Another purpose is to identify potential future funding sources for project implementation. There are many natural resource enhancement efforts and projects occurring in the subbasin which are relevant to the goals of the plan. These efforts, in addition to proposed future actions are described in the Management Measures element of this Plan.

Potential Sources of Project Funding

Funding is essential to implementing projects associated with this WQMP. There are many sources of local, state, and federal funds. The following is a partial list of assistance programs available in the Tualatin River Subbasin.

<u>Program</u>	<u>Agency/Source</u>
Oregon Plan for Salmon and Watersheds	OWEB
Environmental Quality Incentives Program	USDA-NRCS
Wetland Reserve Program	USDA-NRCS
Conservation Reserve Enhancement Program	USDA-NRCS
Stewardship Incentive Program	ODF
Access and Habitat Program	ODFW
Partners for Wildlife Program	USDI-FSA
Conservation Implementation Grants	ODA
Water Projects	WRD
Nonpoint Source Water Quality Control (EPA 319)	ODEQ-EPA
Riparian Protection/Enhancement	COE
Oregon Community Foundation	OCF

Grant funds are available for improvement projects on a competitive basis. Field agency personnel assist landowners in identifying, designing, and submitting eligible projects for these grant funds. For private landowners, the recipient and administrator of these grants is generally the local Soil and Water Conservation District. Grant fund sources include:

Oregon Watershed Enhancement Board (OWEB) which funds watershed improvement projects with state money. This is an important piece in the implementation of Oregon's Salmon Plan. Current and past projects have included road relocation/closure/improvement projects, in-stream structure work, riparian fencing and revegetation, off stream water developments, and other management practices.

Bonneville Power Administration funds are federal funds for fish habitat and water quality improvement projects. These have also included projects addressing road conditions, grazing management, in-stream structure, and other tools.

Individual grant sources for special projects have included Forest Health money available through the State and Private arm of the USDA Forest Service.

CHAPTER 12 – CITATION TO LEGAL AUTHORITIES

Clean Water Act Section 303(d)

Section 303(d) of the 1972 federal Clean Water Act as amended requires states to develop a list of rivers, streams and lakes that cannot meet water quality standards without application of additional pollution controls beyond the existing requirements on industrial sources and sewage treatment plants. Waters that need this additional help are referred to as “water quality limited” (WQL). Water quality limited waterbodies must be identified by the Environmental Protection Agency (EPA) or by a state agency which has been delegated this responsibility by EPA. In Oregon, this responsibility rests with the ODEQ. The ODEQ updates the list of water quality limited waters every two years. The list is referred to as the 303(d) list. Section 303 of the Clean Water Act further requires that Total Maximum Daily Loads (TMDLs) be developed for all waters on the 303(d) list. A TMDL defines the amount of pollution that can be present in the waterbody without causing water quality standards to be violated. An WQMP is developed to describe a strategy for reducing water pollution to the level of the load allocations and waste load allocations prescribed in the TMDL, which is designed to restore the water quality and result in compliance with the water quality standards. In this way, the designated beneficial uses of the water will be protected for all citizens.

NPDES and WPCF Permit Programs

The ODEQ administers two different types of wastewater permits in implementing Oregon Revised Statute (ORS) 468B.050. These are: the National Pollution Discharge Elimination System (NPDES) permits for waste discharge; and Water Pollution Control Facilities (WPCF) permits for waste disposal. The NPDES permit is also a Federal permit and is required under the Clean Water Act. The WPCF permit is a state program. As permits are renewed they will be revised to insure that all 303(d) related issues are addressed in the permit.

Oregon Administrative Rules

The following Oregon Administrative Rules provide numeric and narrative criteria for parameters of concern in the Tualatin River Subbasin:

Water Quality Standard/Criteria of Concern: Nuisance Algal Growth, pH

Applicable Rules: OAR 340-41-150
OAR 340-41-442
OAR 340-41-445(2)(d)

TMDL Parameter: Phosphorus

Applicable Rules: OAR 340-41-006
OAR 340-41-470(9)

TMDL Parameter: Temperature

Applicable Rules: OAR 340-41-445(various)
OAR 340-41-026(3)(a)(D)
OAR 340-41-006(54) and (55)

TMDL Parameter: Dissolved Oxygen

Applicable Rules: OAR 340-041-445(1)(E)

TMDL Parameter: Bacteria

Applicable Rules: OAR 340-41-205(2)(e)(A)(I)
OAR 340-41-205(2)(b)
OAR 340-41-445(2)(e)(B)
OAR 340-41-445(2)(e)(C)
OAR 340-41-445(2)(f)

Oregon Forest Practices Act

The Oregon Department of Forestry (ODF) is the designated management agency for regulation of water quality on non-federal forest lands. The Board of Forestry has adopted water protection rules, including but not limited to OAR Chapter 629, Divisions 635-660, which describes BMPs for forest operations. The Environmental Quality Commission (EQC), Board of Forestry, ODEQ and ODF have agreed that these pollution control measures will be relied upon to result in achievement of state water quality standards.

ODF and ODEQ statutes and rules also include provisions for adaptive management that provide for revisions to FPA practices where necessary to meet water quality standards. These provisions are described in ORS 527.710, ORS 527.765, ORS 183.310, OAR 340-041-0026, OAR 629-635-110, and OAR 340-041-0120.

Senate Bill 1010

The Oregon Department of Agriculture has primary responsibility for control of pollution from agriculture sources. This is accomplished through the Agriculture Water Quality Management (AWQM) program authorities granted ODA under Senate Bill 1010 Adopted by the Oregon State Legislature in 1993. The AWQM Act directs the ODA to work with local farmers and ranchers to develop water quality management plans for specific watersheds that have been identified as violating water quality standards and have agriculture water pollution contributions. The agriculture water quality management plans are expected to identify problems in the watershed that need to be addressed and outline ways to correct the problems.

Local Ordinances

Within the Implementation Plans in the appendices, the DMAs are expected to describe their specific legal authorities to carry out the management measures they choose to meet the TMDL allocations. Legal authority to enforce the provisions of a City's NPDES permit would be a specific example of legal authority to carry out management measures.

CHAPTER 13 - IMPLEMENTATION AND ADAPTIVE MANAGEMENT ISSUES

The goal of the Clean Water Act and associated Oregon Administrative Rules is that water quality standards shall be met or that all feasible steps will be taken towards achieving the highest quality water attainable. This is a long-term goal in many watersheds, particularly where non-point sources are the main concern. To achieve this goal, implementation must commence as soon as possible.

Total Maximum Daily Loads (TMDLs) are numerical loadings that are set to limit pollutant levels such that in-stream water quality standards are met. DEQ recognizes that TMDLs are values calculated from mathematical models and other analytical techniques designed to simulate and/or predict very complex physical, chemical and biological processes. Models and techniques are simplifications of these complex processes and, as such, are unlikely to produce an exact prediction of how streams and other waterbodies will respond to the application of various management measures. It is also recognized that there is a varying level of uncertainty in the TMDLs depending on factors such as amount of data that is available and how well the processes listed above are understood. It is for this reason that the TMDLs have been established with a margin of safety. Subject to available resources, DEQ will review and, if necessary, modify TMDLs established for a subbasin on a five-year basis or possibly sooner if DEQ determines that new scientific information is available that indicates significant changes to the TMDL are needed.

Water Quality Management Plans (WQMPs) are plans designed to reduce pollutant loads to meet TMDLs. DEQ recognizes that it may take some period of time—from several years to several decades-- after full implementation before management practices identified in a WQMP become fully effective in reducing and controlling certain forms of pollution such as heat loads from lack of riparian vegetation. In addition, DEQ recognizes that technology for controlling some pollution sources such as nonpoint sources and stormwater is, in many cases, in the development stages and will likely take one or more iterations to develop effective techniques. It is possible that after application of all reasonable best management practices, some TMDLs or their associated surrogates cannot be achieved as originally established.

DEQ also recognizes that, despite the best and most sincere efforts, natural events beyond the control of humans may interfere with or delay attainment of the TMDL and/or its associated surrogates. Such events could be, but are not limited to, floods, fire, insect infestations, and drought.

In this TMDL, pollutant surrogates have been defined as alternative targets for meeting the TMDL for some parameters. The purpose of the surrogates is not to bar or eliminate human access or activity in the subbasin or its riparian areas. It is the expectation, however, that WQMPs will address how human activities will be managed to achieve the surrogates. It is also recognized that full attainment of pollutant surrogates (system potential vegetation, for example) at all locations may not be feasible due to physical, legal or other regulatory constraints. To the extent possible, WQMPs should identify potential constraints, but should also provide the ability to mitigate those constraints should the opportunity arise. For instance, at this time, the existing location of a road or highway may preclude attainment of system potential vegetation due to safety considerations. In the future, however, should the road be expanded or upgraded, consideration should be given to designs that support TMDL load allocations and pollutant surrogates such as system potential vegetation.

When developing water quality-based effluent limits for NPDES permits, DEQ will ensure that effluent limits developed are consistent with the assumptions and requirements of the wasteload allocation (CFR

122.44(d)(1)(vii)(B)). Similarly, the Department will work with nonpoint sources in developing management plans that are consistent in meeting the assumptions and requirements of the load allocations. These permits and plans will be developed/modified within 1-2 years following the develop/modification of a TMDL and include but not be limited to the following (February 2000 MOA between DEQ and EPA):

- management measures tied to attainment of the TMDL,
- timeline for implementation (including appropriate incremental measurable water quality targets and milestones for implementing control actions),
- timeline for attainment of water quality standards including an explanation of how implementation is expected to result in the attainment of water quality standards,
- monitoring and evaluation

If a source that is covered by this TMDL complies with its permit, WQMP or applicable forest practice rules, it will be considered in compliance with the TMDL.

DEQ intends to regularly review progress of WQMPs to achieve TMDLs. If and when DEQ determines that WQMP have been fully implemented, that all feasible management practices have reached maximum expected effectiveness and a TMDL or its interim targets have not been achieved, the Department shall reopen the TMDL and adjust it or its interim targets and its associated water quality standard(s) as necessary. The determination that all feasible steps have been taken will be based on, but not limited to, a site-specific balance of the following criteria: protection of beneficial uses; appropriateness to local conditions; use of best treatment technologies or management practices or measures; and cost of compliance (OAR 340-41-026(3)(a)(D)(ii)).

The implementation of TMDLs and the associated management plans is generally enforceable by DEQ, other state agencies and local government. However, it is envisioned that sufficient initiative exists to achieve water quality goals with minimal enforcement. Should the need for additional effort emerge, it is expected that the responsible agency will work with land managers and permit holders to overcome impediments to progress through education, technical support or enforcement. Enforcement may be necessary in instances of insufficient action towards progress. In the case of nonpoint sources, this could occur first through direct intervention from land management agencies (e.g. ODF, ODA, counties and cities), and secondarily through DEQ. The latter may be based in departmental orders to implement management goals leading to water quality standards.

A zero waste load allocation does not necessarily mean that a point source is prohibited from discharging any wastes. A source may be permitted to discharge by DEQ if the holder can adequately demonstrate that the discharge will not have a significant impact on water quality over that achieved by a zero allocation. For instance, a permit applicant may be able to demonstrate that a proposed thermal discharge would not have a measurable detrimental impact on projected stream temperatures when system temperature is achieved. Or, in the case where a TMDL is set based upon attainment of a specific pollutant concentration, a source could be permitted to discharge at that concentration and still be considered as meeting a zero allocation.

Adaptive Management

In employing an adaptive management approach to this TMDL and WQMP, DEQ has the following expectations and intentions:

- Subject to available resources, DEQ will review and, if necessary, modify TMDLs and WQMPs established for a subbasin on a five-year basis or possibly sooner if DEQ determines that new scientific information is available that indicates significant changes to the TMDL are needed.
- When developing water quality-based effluent limits for NPDES permits, DEQ will ensure that effluent limits developed are consistent with the assumptions and requirements of the wasteload allocation (CFR 122.44(d)(1)(vii)(B)).
- In conducting this review, DEQ will evaluate the progress towards achieving the TMDL (and water quality standards) and the success of implementing the WQMP.

- DEQ expects that each management agency will also monitor and document its progress in implementing the provisions of its component of the WQMP. This information will be provided to DEQ for its use in reviewing the TMDL.
- As implementation of the WQMP proceeds, DEQ expects that management agencies will develop benchmarks for attainment of TMDL surrogates, which can then be used to measure progress.
- Where implementation of the WQMP or effectiveness of management techniques are found to be inadequate, DEQ expects management agencies to revise the components of the WQMP to address these deficiencies.
- When DEQ, in consultation with the management agencies, concludes that all feasible steps have been taken to meet the TMDL and its associated surrogates and attainment of water quality standards, the TMDL, or the associated surrogates is not practicable, it will reopen the TMDL and adjust it or its interim targets and its associated water quality standard(s) as necessary. The determination that all feasible steps have been taken will be based on, but not limited to, a site-specific balance of the following criteria: protection of beneficial uses; appropriateness to local conditions; use of best treatment technologies or management practices or measures; and cost of compliance (OAR 340-41-026(3)(a)(D)(ii)).

Appendix 1 – Department of Forestry

Implementation Plan for Non-Federal Forest Lands

Non-Federal Forest Lands

The purpose and goals of Oregon's Water Protection Rules (OAR 629-635-100) include protecting, maintaining, and improving the functions and values of streams, lakes, wetlands, and riparian management areas. Best management practices (BMPs) in the Oregon Forest Practices Act (FPA), including riparian zone protection measures and a host of other measures described below, are the mechanism for meeting State Water Quality Standards (WQS). There is a substantial body of scientific research and monitoring that supports an underlying assumption of the FPA, that maintaining riparian processes and functions is critical for water quality and fish and wildlife habitat. These riparian processes and functions include: Shade for stream temperature and for riparian species; large wood delivery to streams and riparian areas; leaf and other organic matter inputs; riparian microclimate regulation; sediment trapping; soil moisture and temperature maintenance; providing aquatic and riparian species dependent habitat; and nutrient and mineral cycling. The FPA provides a broad array of water quality benefits and contributes to meeting water quality standards for water quality parameters such as temperature, sediment, phosphorus, dissolved oxygen, nutrients, aquatic habitat and others.

Currently, many streams within the Tualatin River Basin significantly exceed the WQS's for the parameters of concern. The water quality impairment(s) in the Tualatin Basin clearly do not result solely from current forestry activities. Agricultural areas, and especially the extensive urban areas, contribute significantly to water quality impairment within the basin. It is also important to note that historic forest practices such as splash dam activities, use of log puncheon culverts, abandoned forest roads, and the widespread removal of wood from streams may continue to influence current stream conditions and riparian functions. In addition, current forest practices occur on forestlands that simultaneously support non-forestry land uses that can affect water quality, such as recreation, grazing and public access roads.

Water quality parameters are influenced in a number of ways. For example, it is recognized that increasing the level of riparian vegetation retained along forested reaches of these streams reduces solar loading, potentially preventing a substantial amount of stream heating. While providing high levels of shade to streams is an important aspect of meeting instream temperature standards it needs to be considered within the context of past management, stream morphology and flows, groundwater influences, site-productivity, insects, fire, and other disturbance mechanisms that vary in time and space across the landscape.

The amount of sediment reaching streams can also affect water quality. For example, it is recognized that, proper road construction and culvert placement, good road maintenance, appropriate road surfacing, locating side-cast and soil waste materials in stable locations, properly placing and removing temporary stream crossings, establishing appropriate water-bars on skid trails, using appropriate harvesting systems and techniques, proper site preparation (including slash disposal), among other sound forestry practices, can reduce or eliminate sediment from entering streams. The FPA deals with these and other forest activities.

As described below, ODF and DEQ are involved in several statewide efforts to analyze the existing FPA measures and to better define the relationship between TMDL load allocations and the FPA measures designed to protect water quality. How water quality parameters are affected, as established through the TMDL process as well as other monitoring data, will be an important part of the body of information used in determining the adequacy of the FPA.

Forest practices on non-federal land in Oregon are regulated under the FPA and implemented through administrative rules that are administered by the Oregon Department of Forestry (ODF). The Oregon Board of Forestry (BOF), in consultation with the Environmental Quality Commission (EQC), establish BMPs and other rules to ensure that, to the extent practicable, non-point source (NPS) pollution resulting from forest operations does not impair the attainment of water quality standards.

With respect to the temperature standard, surface water temperature management plans are required according to OAR 340-041-0026 when temperature criteria are exceeded and the waterbody is designated as water-quality limited under Section 303(d) of the Clean Water Act. In the case of state and private forestlands, OAR 340-041-0120 identifies the FPA rules as the surface water management plan

for forestry activities. The DEQ recognizes (through a Memorandum of Understanding with ODF) that the FPA provide the Best Management Practices (BMPs) for forest activities on non-federal forest land in Oregon.

ODF and DEQ statutes and rules also include provisions for adaptive management that provide for revisions to FPA practices where necessary to meet water quality standards. These provisions are described in ORS 527.710, ORS 527.765, ORS 183.310, OAR 340-041-0026, OAR 629-635-110, and OAR 340-041-0120. Current adaptive management efforts under several of the above statutes and rules are described in more detail following the discussion below on the roles of the BOF and EQC in developing BMPs that will achieve water quality standards.

ORS 527.765 Best management practices to maintain water quality.

(1) The State Board of Forestry shall establish best management practices and other rules applying to forest practices as necessary to insure that to the maximum extent practicable nonpoint source discharges of pollutants resulting from forest operations on forestlands do not impair the achievement and maintenance of water quality standards established by the Environmental Quality Commission for the waters of the state. Such best management practices shall consist of forest practices rules adopted to prevent or reduce pollution of waters of the state. Factors to be considered by the board in establishing best management practices shall include, where applicable, but not be limited to:

- (a) Beneficial uses of waters potentially impacted;
- (b) The effects of past forest practices on beneficial uses of water;
- (c) Appropriate practices employed by other forest managers;
- (d) Technical, economic and institutional feasibility; and
- (e) Natural variations in geomorphology and hydrology.

ORS 527.770 Good faith compliance with best management practices not violation of water quality standards; subsequent enforcement of standards.

A forest operator conducting, or in good faith proposing to conduct, operations in accordance with best management practices currently in effect shall not be considered in violation of any water quality standards. When the State Board of Forestry adopts new best management practices and other rules applying to forest operations, such rules shall apply to all current or proposed forest operations upon their effective dates.

There are currently extensive statutes and administrative rules that regulate forest management activities in the Tualatin Basin, which address the key water quality issues of stream temperatures, riparian aquatic functions, and sediment dynamics. The following is a list of specific administrative rules describing the purpose and goals of the FPA towards the achievement and maintenance of water quality standards established by the EQC.

OAR 629-635-100 - Water Protection Rules; Purpose and Goals

(3) The purpose of the water protection rules is to protect, maintain and, where appropriate, improve the functions and values of streams, lakes, wetlands, and riparian management areas. These functions and values include water quality, hydrologic functions, the growing and harvesting of trees, and fish and wildlife resources.

(4) The water protection rules include general vegetation retention prescriptions for streams, lakes and wetlands that apply where current vegetation conditions within the riparian management area have or are likely to develop characteristics of mature forest stands in a "timely manner." Landowners are encouraged to manage stands within riparian management areas in order to grow trees in excess of what must be retained so that the excess may be harvested.

(5) The water protection rules also include alternative vegetation retention prescriptions for streams to allow incentives for operators to actively manage vegetation where existing vegetation conditions are not likely to develop characteristics of mature conifer forest stands in a "timely manner."

(6) OARs 629-640-400 and 629-645-020 allow an operator to propose site-specific prescriptions for sites where specific evaluation of vegetation within a riparian management area and/or the condition of

the water of the state is used to identify the appropriate practices for achieving the vegetation and protection goals.

- (7) The overall goal of the water protection rules is to provide resource protection during operations adjacent to and within streams, lakes, wetlands and riparian management areas so that, while continuing to grow and harvest trees, the protection goals for fish, wildlife, and water quality are met.
 - (a) The protection goal for water quality (as prescribed in ORS 527.765) is to ensure through the described forest practices that, to the maximum extent practicable, non-point source discharges of pollutants resulting from forest operations do not impair the achievement and maintenance of the water quality standards.
 - (b) The protection goal for fish is to establish and retain vegetation consistent with the vegetation retention objectives described in OAR 629-640-000 (streams), OAR 629-645-000 (significant wetlands), and OAR 629-650-000 (lakes) that will maintain water quality and provide aquatic habitat components and functions such as shade, large woody debris, and nutrients.

OAR 629-640-000 - Vegetation Retention Goals for Streams; Desired Future Conditions

- (1) The purpose of this rule is to describe how the vegetation retention measures for streams were determined, their purpose and how the measures are implemented. The vegetation retention requirements for streams described in OAR 629-640-100 through OAR 629-640-400 are designed to produce desired future conditions for the wide range of stand types, channel conditions, and disturbance regimes that exist throughout forestlands in Oregon.
- (2) The desired future condition for streamside areas along fish use streams is to grow and retain vegetation so that, over time, average conditions across the landscape become similar to those of mature streamside stands. Oregon has a tremendous diversity of forest tree species growing along waters of the state and the age of mature streamside stands varies by species. Mature streamside stands are often dominated by conifer trees. For many conifer stands, mature stands occur between 80 and 200 years of stand age. Hardwood stands and some conifer stands may become mature at an earlier age. Mature stands provide ample shade over the channel, an abundance of large woody debris in the channel, channel-influencing root masses along the edge of the high water level, snags, and regular inputs of nutrients through litter fall.
- (3) The rule standards for desired future conditions for fish use streams were developed by estimating the conifer basal area for average unmanaged mature streamside stands (at age 120) for each geographic region. This was done by using normal conifer yield tables for the average upland stand in the geographic region, and then adjusting the basal area for the effects of riparian influences on stocking, growth and mortality or by using available streamside stand data for mature stands.
- (4) The desired future condition for streamside areas that do not have fish use is to have sufficient streamside vegetation to support the functions and processes that are important to downstream fish use waters and domestic water use and to supplement wildlife habitat across the landscape. Such functions and processes include: maintenance of cool water temperature and other water quality parameters; influences on sediment production and bank stability; additions of nutrients and large conifer organic debris; and provision of snags, cover, and trees for wildlife.
- (5) The rule standards for desired future conditions for streams that do not have fish use were developed in a manner similar to fish use streams. In calculating the rule standards, other factors used in developing the desired future condition for large streams without fish use and all medium and small streams included the effects of trees regenerated in the riparian management area during the next rotation and desired levels of instream large woody debris.
- (6) For streamside areas where the native tree community would be conifer dominated stands, mature streamside conditions are achieved by retaining a sufficient amount of conifers next to large and medium sized fish use streams at the time of harvest, so that halfway through the next rotation or period between harvest entries, the conifer basal area and density is similar to mature

unmanaged conifer stands. In calculating the rule standards, a rotation age of 50 years was assumed for even-aged management and a period between entries of 25 years was assumed for uneven-aged management. The long-term maintenance of streamside conifer stands is likely to require incentives to landowners to manage streamside areas so that conifer reforestation occurs to replace older conifers over time.

- (7) Conifer basal area and density targets to produce mature stand conditions over time are outlined in the general vegetation retention prescriptions. In order to ensure compliance with state water quality standards, these rules include requirements to retain all trees within 20 feet and understory vegetation within 10 feet of the high water level of specified channels to provide shade.
- (8) For streamside areas where the native tree community would be hardwood dominated stands, mature streamside conditions are achieved by retaining sufficient hardwood trees. As early successional species, the long-term maintenance of hardwood streamside stands will in some cases require managed harvest using site specific vegetation retention prescriptions so that reforestation occurs to replace older trees. In order to ensure compliance with state water quality standards, these rules include requirements in the general vegetation retention prescription to retain all trees within 20 feet and understory vegetation within 10 feet of the high water level of specified channels to provide shade.
- (9) In many cases the desired future condition for streams can be achieved by applying the general vegetation retention prescriptions, as described in OAR 629-640-100 and OAR 629-640-200. In other cases, the existing streamside vegetation may be incapable of developing into the future desired conditions in a "timely manner." In this case, the operator can apply an alternative vegetation retention prescription described in OAR 629-640-300 or develop a site specific vegetation retention prescription described in OAR 629-640-400. For the purposes of the water protection rules, "in a timely manner" means that the trees within the riparian management area will meet or exceed the applicable basal area target or vegetation retention goal during the period of the next harvest entry that would be normal for the site. This will be 50 years for many sites.
- (10) Where the native tree community would be conifer dominant stands, but due to historical events the stand has become dominated by hardwoods, in particular, red alder, disturbance is allowed to produce conditions suitable for the re-establishment of conifer. In this and other situations where the existing streamside vegetation is incapable of developing characteristics of a mature streamside stand in a "timely manner," the desired action is to manipulate the streamside area and woody debris levels at the time of harvest (through an alternative vegetation retention prescription or site specific vegetation retention prescription) to attain such characteristics more quickly.

The Water Protection Rules are an important component of the rules that are designed to achieve and maintain water quality standards. The rules identify seven geographic regions and distinguishes between streams, lakes, and wetlands. The rules further distinguish each stream by size and type. Stream size is distinguished as small, medium, or large, based on average annual flow. Stream type is distinguished as fish use, domestic use, or neither.

Generally, no tree harvesting is allowed within 20 feet of all fish bearing, all domestic-use, and all other medium and large streams unless stand restoration is needed. In addition, all snags and downed wood must be retained in every riparian management area. Provisions governing vegetation retention are designed to encourage conifer restoration on riparian forestland that is not currently in the desired conifer condition. Future supplies of conifer on these sites are deemed desirable to support stream functions and to provide fish and wildlife habitat. The rules provide incentives for landowners to place large wood in streams to immediately enhance fish habitat. Other alternatives are provided to address site-specific conditions and large-scale catastrophic events.

The goal for managing riparian forests along fish-use streams is to grow and retain vegetation so that, over time, average conditions across the riparian landscape become similar to those of mature unmanaged riparian stands. This goal is based on the following considerations:

(1) Mature riparian stands can supply large, persistent woody debris necessary to maintain adequate fish habitat. A shortage of large wood currently exists in streams on non-federal forestlands due to historic practices and a wide distribution of young, second growth forests. For most streams, mature riparian stands are able to provide more of the functions and inputs of large wood than are provided by young second-growth trees.

(2) Historically, riparian forests were periodically disturbed by wildfire, windstorms, floods, and disease. These forests were also impacted by wildlife such as beaver, deer, and elk. These disturbances maintained a forest landscape comprised of riparian stands of all ages ranging from early successional to old growth. At any given time, however, it is likely that a significant proportion of the riparian areas supported forests of mature age classes. This distribution of mature riparian forests supported a supply of large, persistent woody debris that was important in maintaining quality fish habitat.

The overall goals of the riparian vegetation retention rules along Type N and Type D streams are the following:

- Grow and retain vegetation sufficient to support the functions and processes that are important to downstream waters that have fish;
- Maintain the quality of domestic water; and
- Supplement wildlife habitat across the landscape.

These streams have reduced Riparian Management Area (RMA) widths and reduced basal area retention requirements as compared to similar sized Type F streams (Table 1). In the design of the rules this was judged appropriate based on a few assumptions. First, it was assumed that the amount of large wood entering Type N and D channels over time was not as important for maintaining fish populations within a given stream reach. And second, it was assumed that the future stand could provide some level of “functional” wood over time in terms of nutrient inputs and sediment storage. The validity of these assumptions needs to be evaluated over time through monitoring.

Table 1. Riparian Management Area widths for streams of various sizes and beneficial uses (OAR 629-635-310).

	Type F	Type D	Type N
<i>LARGE</i>	100 feet	70 feet	70 feet
<i>MEDIUM</i>	70 feet	50 feet	50 feet
<i>SMALL</i>	50 feet	20 feet	Apply specified water quality protection measures, and see OAR 629-640-200

For all streams that require an RMA, basal area targets are established that are used for any type of management within the RMA. These targets were determined based on the data that was available at the time, with the expectation that these targets could be achieved on the ground. There is also a minimum tree number requirement of 40 trees per 1000 feet along large streams (11-inch minimum diameter at breast height), and 30 trees per 1000 feet along medium streams (8-inch minimum diameter at breast height). The specific levels of large wood inputs that the rules are designed to achieve are based on the stream size and type. The biological and physical characteristics specific to a given stream are taken into account in determining the quantity and quality of large wood that is functional for that stream. Given the potential large wood that is functional for a given stream, a combination of basal area

targets, minimum tree retention, buffer widths, and future regenerated stands and ingrowth are used to achieve the appropriate large wood inputs and effective shade for a given stream.

The expectation is that these vegetation retention standards will be sufficient towards maintaining stream temperatures that are within the range of natural variability. In the design of the Water Protection Rules shade data was gathered for 40 small non-fish-bearing streams to determine the shade recovery rates after harvesting. One to two years after harvest, 55 percent of these streams were at or above pre-harvest shade levels due to understory vegetation regrowth. Most of these streams had a bankfull width averaging less than six feet, and most shade was provided by shrubs and grasses within 10 feet of the bank. Since 1991 there has also been a 120-acre limit on a single clearcut size, which is likely to result in a scattering of harvested area across a watershed over time. In the development of the rules it was assumed that this combined with the relative rapid shade recovery along smaller non-fish-bearing streams would be adequate in protecting stream temperatures and reduce possible cumulative effects. For fish bearing streams it is assumed that a 20-foot no-harvest area, combined with the tree retention requirements for the rest of the RMA, will be adequate to maintain shade levels necessary to achieve stream temperature standards. The monitoring program is currently collecting data to test these assumptions, evaluate the effectiveness of the rules, and evaluate whether or not water quality standards for temperature are being achieved.

In terms of sediment issues specific to forest roads, there are BMPs within the FPA specifically designed to regulate road design, construction and maintenance. The bulk of the BMPs are directed at minimizing sediment delivery to channels. The primary goals of the road rules are to: (1) protect the water quality of streams, lakes, and wetlands; (2) protect fish and wildlife habitat; and (3) protect forest productivity.

The Board of Forestry revised several BMPs related to road design when the new Water Protection Rules were adopted in the fall of 1994. Significant changes made to the road construction rules include the following:

- The requirement for operators not to locate roads in riparian management areas, flood plains, or wetlands unless all alternative locations would result in greater resource damage.
- The requirement for operators to design stream crossings to both minimize fill size and minimize excavation of slopes near the channel. A mandatory written plan is required for stream crossing fills over 15 feet deep.
- The requirement to design stream crossing structures for the 50-year flow with no ponding, rather than the 25-year storm with no specification of allowable ponding.
- The requirement that stream crossing structures be passable by juvenile fish as well as adult fish.
- The requirement that fish must be able to access side channels.
- The requirement that stream structures constructed under these rules must be maintained for fish passage.

In determining the location of a new road, operators are required to avoid steep slopes, slides and areas next to channels or in wetlands to the extent possible. Existing roads should be used when possible, and stream crossings should be used only when essential. The design of the road grade must vary to fit the local terrain and the road width must be minimized. The operator must also follow specific guidelines for stream-crossing structures (listed above). Cross-drainage structures must be designed to divert water away from channels so that runoff intercepted by the road is dispersed onto the hillslope before reaching a channel. The specific method used is up to the operator, but the end result should be the dispersal of water running off of the road and the filtering of fine sediment before the water reaches waters of the state.

Construction and maintenance activities should be done during low water periods and when soils are relatively dry. Excavated materials must be placed where there is minimal risk of those materials entering waters of the state, and erodible surfaces must be stabilized. Landings must be built away from streams, wetlands and steep slopes.

Road maintenance is required on all active and inactive roads. Regardless of when a road was constructed, if the road has been used as part of an active operation after 1972, it is subject to all maintenance requirements within the current rules. Culverts must be kept open, and surface road drainage and adequate filtering of fine sediment must be maintained. If the road surface becomes unstable or if there is a significant risk of sediment running off of the road surface and entering the stream, road activity must be halted and the erodible area must be stabilized. Abandoned roads constructed prior to 1972 and not used for forest management since that time are not subject to Forest Practices regulatory authority.

All roads in use since 1972 must either be maintained or vacated by the operator. Vacated roads must be effectively barricaded and self-maintaining, in terms of diverting water away from streams and off of the former road surface, where erosion will remain unlikely. Methods for vacating roads include pulling stream-crossing fills, pulling steep side cast fills, and cross ditching. It is up to the landowner to choose between vacating a road and maintaining a road. If a road is not vacated, the operator is required to maintain the road under the current rules whether it is active or inactive, however they are not required to bring the design up to current standards outside of the normal maintenance and repair schedule.

The ODF has a monitoring program that is currently coordinating separate projects to monitor the effectiveness of the forest practice rules with regard to landslides, riparian function, stream temperature, chemical applications, sediment from roads, BMP compliance, and shade. The results from some of these projects have been released in the form of final reports and other projects will have final reports available in the spring of 2000, 2001 and beyond.

Voluntary measures are currently being implemented across the state under the Oregon Plan for Salmon and Watersheds (OPSW) to address water quality protection. These measures are designed to supplement the conifer stocking within riparian areas, increase large wood inputs to streams, and provide for additional shade. This is accomplished during harvest operations by (1) placing appropriate sized large wood within streams that meet parameters of gradient, width and existing wood in the channel; and (2) relocating in-unit leave trees in priority areas² to maximize their benefit to salmonids while recognizing operational constraints, other wildlife needs, and specific landowner concerns.

The measures include the following:

ODF 8S: Riparian Conifer Restoration

Forest practice rules have been developed to allow and provide incentives for the restoration of conifer forests along hardwood-dominated RMAs where conifers historically were present. This process enables sites capable of growing conifers to contribute conifer LWD in a timelier manner. This process will be modified to require an additional review process before the implementation of conifer restoration within core areas.

ODF 19S: Additional Conifer Retention along Fish-Bearing Streams in Core Areas

This measure retains more conifers in RMAs by limiting harvest activities to 25 percent of the conifer basal area above the standard target. This measure is only applied to RMAs containing a conifer basal area that is greater than the standard target.

ODF 20S: Limited RMA for Small Type N Streams in Core Areas

This measure provides limited 20 foot RMAs along all perennial or intermittent small Type N streams for the purpose of retaining snags and downed wood.

ODF 21S: Active Placement of large wood during Forest Operations

This measure provides a more aggressive and comprehensive program for placing large wood in streams currently deficient of large wood. Placement of large wood is accomplished following

² The Executive Order replaced the concept of “core areas” with “priority areas”. See (1)(f) of the Executive Order (p.5).

existing ODF/ODFW placement guidelines and determining the need for large wood placement is based upon a site-specific stream survey.

ODF 22S: 25 Percent In-unit Leave Tree Placement and Additional Voluntary Retention

This measure has one non-voluntary component and two voluntary components:

- 1) The State Forester, under statutory authority, will direct operators to place 25 percent of in-unit leave trees in or adjacent to riparian management areas on Type F and D streams.
- 2) The operator voluntarily locates the additional 75 percent in-unit leave trees along Type N, D or F streams, and
- 3) The State Forester requests the conifer component be increased to 75 percent from 50 percent.

ODF 61S: Analysis of "Rack" Concept for Debris Flows

OFIC members will conduct surveys to determine the feasibility and value of retaining trees along small type N streams with a high probability of debris flow in a "rack" just above the confluence with a Type F stream. The rack would extend from the RMA along the Type F stream up the Type N stream some distance for the purpose of retaining trees that have a high likelihood of delivery to the Type F stream.

ODF 62S: Voluntary No-Harvest Riparian Management Areas

Establishes a system to report and track, on a site-specific basis, when landowners voluntarily take the opportunity to retain no-harvest RMAs.

The voluntary management measures are implemented within priority areas. Several of the measures utilize in-unit leave trees and are applied in a "menu" approach to the extent in-unit leave trees are available to maximize their value to the restoration of salmonid habitat. The choice of menu measures is at the discretion of the landowner, but one or more of the measures is selected.

The measures can be described as either active restoration measures, or passive restoration measures that provide long-term large wood recruitment. Voluntary measures ODF 8S and 21S are active restoration activities. ODF 8 restores hardwood-dominated riparian areas back to a conifer-dominated condition, where appropriate, using a site-specific plan. Site-specific plans require additional consultation with the ODFW to minimize potential damage to the resource. They often result in conditions that are more protective of the resources than would occur without the site-specific plan. ODF 21S addresses large wood placement if stream surveys determine there is a need. Measures ODF 19S, 20S, 22S, and 62S provide future large wood recruitment through additional riparian protection. This additional protection is accomplished by retaining in-unit leave trees, snags, and downed wood within and along RMAs, and by changing the ratio of in-unit leave trees to 75 percent conifer.

The following application priority has been developed for OPSW voluntary measures for harvest units containing more than one stream type. The list establishes the general priority for placement of in-unit leave trees.

- 1) Small and medium Type F streams.
- 2) Non-fish bearing streams (Type D or Type N), especially small low-order headwater stream channels, that may affect downstream water temperatures and the supply of large wood in priority area streams.
- 3) Streams identified as having a water temperature problem in the DEQ 303(d) list of water quality limited waterbodies, or as evidenced by other available water temperature data; especially reaches where the additional trees would increase the level of aquatic shade.
- 4) Potentially unstable slopes where slope failure could deliver large wood.
- 5) Large Type F streams, especially where low gradient, wide floodplains exist with multiple, braided meandering channels.
- 6) Significant wetlands and stream-associated wetlands, especially estuaries and beaver pond complexes, associated with a salmon core area stream.

The Oregon Plan also has voluntary measures addressing sediment issues related to forest roads. Many forest roads built prior to the development of the FPA or prior to the current BMPs continue to pose increased risk to fish habitat. Industrial forest landowners and state forest lands are currently implementing the Road Hazard Identification and Risk Reduction Project, measures ODF 1S and ODF 2S, to identify risks to salmon from roads and address those risks. The purposes of this project are:

1. Implement a systematic process to identify road-related risks to salmon and steelhead recovery.
2. Establish priorities for problem solution.
3. Implement actions to reduce road related risks.

The Road Hazard Identification and Risk Reduction Project is a major element of the Oregon Plan. The two major field elements of this project are (1) the surveying of roads using the Forest Road Hazard Inventory Protocol, and (2) the repairing of problem sites identified through the protocol. Road repairs conducted as a result of this project include improving fish passage, reducing washout potential, reducing landslide potential, and reducing the delivery of surface erosion to streams.

Roads assessed by this project include all roads on Oregon Forest Industry Council member forestland, plus some other industrial and non-industrial forestland, regardless of when they were constructed. Industrial forest landowners have estimated spending approximately \$13 million a year, or \$130 million over the next 10 years, on this project for the coastal ESUs alone. However, the effort is not limited to nor bound by this funding estimate. Funding for the implementation for this measure within the other ESUs will be reflective of road problems found.

Under ODF 2S, the State Forest Lands program has spent over \$2.5 million during the last biennium (1997-1999) for the restoration of roads, replacement of culverts and other stream crossing structures damaged by the 1996 storm. State Forest Lands are also proposing to spend an additional \$2.5 million dollars in each of the next two biennia to improve roads, including stream crossing structures. This effort will upgrade approximately 130 miles of road in each biennium.

In addition to ODF 1S & 2S, there are additional measures under the Oregon Plan that address road management concerns:

- ODF 16S - Evaluation of the Adequacy of Fish Passage Criteria: Establish that the criteria and guidelines used for the design of stream crossing structures pass fish as intended under the goal.
- ODF 34S - Improve Fish Passage BMPs on Stream Crossing Structures: Ensure that all new stream crossing structures on forestland installed or replaced after the fall of 1994 will pass both adult and juvenile fish upstream and down stream.

Adaptive Management Process

By statute, forest operators conducting operations in accordance with the BMPs are considered to be in compliance with Oregon's water quality standards. The 1994 Water Protection Rules were adopted with the approval of the Environmental Quality Commission as not violating water quality standards. However, there are several provisions within the FPA and rules that require adaptive management.

The ODF is currently in the process of reviewing the effectiveness of the forest practice rules. In January of this year the Governor of Oregon signed Executive Order no. EO 99-01 that directed the Oregon Board of Forestry, with the assistance of an advisory committee, to determine to what extent changes to forest practices are needed to meet state water quality standards and protect and restore salmonids. The committee is directed to consider both regulatory and non-regulatory approaches to water quality protection. To carry out this charge, an ad hoc advisory committee is in the process of developing four separate issue papers on the following topics:

- Fish passage restoration and water classification
- Forest roads
- Riparian functions
- Landslides

The committee represents diverse interests, including environmental, industrial, non-industrial, county, and public advocates. In addition to ODF technical staff, the Oregon Department of Environmental Quality (DEQ) and Oregon Department of Fish and Wildlife (ODFW) have technical staff participating in the process. The committee expects to make recommendations to the Board of Forestry in early 2000. The Board will then consider the recommendations in determining whether revisions to the FPA and additional voluntary approaches are necessary consistent with ORS 527.710.

As the designated management agency (DMA) for water quality management on nonfederal forestlands, ODF is also working with the DEQ through a memorandum of understanding (MOU) signed in June of 1998. This MOU was designed to improve the coordination between the ODF and the DEQ in evaluating and proposing possible changes to the forest practice rules as part of the Total Maximum Daily Load process. The purpose of the MOU is also to guide coordination between the ODF and DEQ regarding water quality limited streams on the 303d list. An evaluation of rule adequacy will be conducted (also referred to as a "sufficiency analysis") through a water quality parameter by parameter analysis. This statewide demonstration of forest practices rule effectiveness in the protection of water quality will address the following specific parameters and will be conducted in the following order³:

- 6) Temperature (estimated draft report target completion date Spring, 2000)
- 7) Sediment and turbidity (estimated date Fall, 2000)
- 8) Aquatic habitat modification (estimated date Spring, 2001)
- 9) Bio-criteria (estimated date Fall, 2001)
- 10) Other parameters (estimated date Spring, 2002)

These sufficiency analyses will be reviewed by peers and other interested parties prior to final release. The analyses will be designed to provide background information and techniques for watershed-based assessments of BMP effectiveness and water quality assessments for watershed with forest and mixed land uses. Once the sufficiency analyses are completed, they will be used as a coarse screen for common elements applicable to each individual TMDL to determine if forest practices are contributing to water quality impairment within a given watershed and to support the adaptive management process.

There may be circumstances unique to a watershed or information generated outside of the statewide sufficiency process that need to be considered to adequately evaluate the effectiveness of the BMPs in meeting water quality standards. Information from the TMDL, ad hoc committee process, ODF Water Protection Rule effectiveness monitoring program, and other relevant sources may address circumstances or issues not addressed by the statewide sufficiency process. This information will also be considered in making the FPA sufficiency determination. ODF and DEQ will share their understanding of whether water quality impairment is due to current forest practices or the long-term legacy of historic forest management practices and/or other practices. The two agencies will then work together and use their determinations to figure out which condition exists (a, b, c, or d in the MOU). The MOU describes the appropriate response depending on which condition exists.

Currently ODF and DEQ do not have adequate data to make a collective determination on the sufficiency of the current FPA BMPs in meeting water quality standards within the Tualatin Basin. This situation most closely resembles the scenario described under condition c of the ODF/DEQ MOU. Therefore, the current BMPs will remain as the forestry component of the TMDL. The draft versions of the statewide FPA sufficiency analyses for the various water quality parameters will be completed as noted above. The proposed Tualatin River TMDLs will be completed in the fall of 2000. Data from an ODF/DEQ shade

³ The estimated completion dates listed here differ from those dates listed in the MOU. Due to unforeseen circumstances the DEQ and ODF have agreed to revise the dates.

study will be collected over the summer of 1999 and a final report will be completed in the Summer of 2000. Information from the ad hoc committee advisory process may be available by Summer of 2000. Information from these efforts, along with other relevant information provided by the DEQ, will be considered in reaching a determination on whether the existing FPA BMPs meet water quality standards within the Tualatin basin.

The above adaptive management process may result in findings that indicate changes are needed to the current forest practice rules to protect water quality. Any rule making that occurs must comply with the standards articulated under ORS 527.714(5). This statute requires, among other things, that regulatory and non-regulatory alternatives have been considered and that the benefits provided by a new rule are in proportion to the degree that existing forest practices contribute to the overall resource concern.

Appendix 2 – Department of Agriculture

TMDL Implementation Plan

OREGON DEPARTMENT OF AGRICULTURE
TUALATIN BASIN DESIGNATED MANAGEMENT AGENCY
TMDL IMPLEMENTATION STRATEGY
JANUARY 31, 2000

INTRODUCTION

In recent years, ODA gained responsibility for controlling nonpoint source pollution from agricultural activities and soil erosion statewide. ODA has the additional responsibility of meeting load allocations as a Designated Management Agency (DMA) in the Tualatin Basin.

ODA's water quality programs in the Tualatin Basin include public outreach and education, the Tualatin Agricultural Water Quality Management (AgWQM) Area Plan, the Confined Animal Feeding Operation (CAFO) Program, and the Container Nursery Program. ODA monitors and evaluates program success through annual water quality sampling in agricultural tributaries, compliance surveys, and inspections.

As TMDLs are developed and revised for several parameters in the Tualatin Basin, the Oregon Department of Environmental Quality (DEQ) requested ODA to submit an implementation plan detailing ODA's current efforts to meet TMDLs, ODA's existing programs that may address new TMDLs, and strategies and a timeline for addressing new TMDLs. The following document summarizes ODA's plans for meeting existing and future TMDLs.

AREA OF RESPONSIBILITY

ODA became the lead authority for working with agriculture to address nonpoint source pollution when the Oregon State Legislature passed Senate Bill 1010 in 1993 and Senate Bill 502 in 1995. Senate Bill 1010 authorized ODA to develop and implement an agricultural water quality management plan wherever a water quality management plan was required by state or federal law. Senate Bill 502 then gave ODA the exclusive authority to regulate agriculture for water quality. Through the adoption of OARS 603-095-0010 through 603-095-0140, ODA now regulates water quality on all agricultural operations in the Tualatin Basin, including nurseries and confined animal feeding operations (CAFOs).

ODA, the Washington County Soil and Water Conservation District (WCSWCD), and a Local Advisory Committee (LAC) consisting primarily of affected landowners developed Oregon's first Agricultural Water Quality Management Plan in the Tualatin Basin. The Plan included Administrative Rules prohibiting certain conditions on agricultural and rural lands. ODA and WCSWCD have been implementing the Tualatin Agricultural Water Quality Management Area Plan and Rules since 1996. The Natural Resources Conservation Service (NRCS) is a technical resource for the WCSWCD and although it has no mandated role in the Tualatin AgWQM Area Plan implementation process, NRCS has also worked toward implementing the Plan.

In 1999, the Local Advisory Committee met to review and update the Tualatin AgWQM Area Plan. The LAC added provisions to the Plan strongly encouraging landowners to plant and maintain trees and shrubs in near stream areas. No amendments to the Administrative Rules were recommended.

PROGRAM OBJECTIVES

ODA's primary objective in the Tualatin Basin is to prevent nonpoint source pollution from agricultural activities and soil erosion and to meet TMDL Load Allocations for phosphorus. It is also ODA's intent is to achieve water quality improvements and Tualatin AgWQM Area Rules compliance through voluntary conservation efforts by private landowners, using enforcement action as a last resort.

Consistent with this policy, ODA, WCSWCD, and other conservation partners planned and completed extensive outreach and education activities to inform agricultural producers and rural landowners about the Tualatin Plan, the Administrative Rules, and the availability of technical assistance to help landowners comply with the rules and meet their individual production goals. ODA, WCSWCD and partners continue education and outreach efforts, and are also working one-on-one with private landowners to help them implement best management practices. ODA believes the combination of outreach, education, voluntary adoption of best management practices, and regulation is helping to reduce phosphorus concentrations in the Tualatin River. These same strategies also address several other parameters of concern in the Tualatin, including bacteria, temperature, and flow. Below is a summary of how ODA's programs address phosphorus and other parameters.

Sediment. Through the Washington County Soil and Water Conservation District, ODA distributes fact sheets on erosion and near-stream management laws for agriculture in the Tualatin Basin. ODA monitors agricultural tributaries within the Tualatin Basin annually for total suspended solids to evaluate BMP effectiveness in addressing sediment runoff and help the WCSWCD target outreach and conservation planning efforts. **WCSWCD and NRCS** staff promote erosion control by speaking at local producer groups and other organizations, meeting one-on-one with landowners to discuss erosion control improvements, and helping landowners implement erosion control practices, including conservation tillage, pasture management, grassed waterways, filter strips, and cover cropping. These practices help landowners protect water quality, maintain soil quality and productivity, prevent runoff of valuable nutrients and other chemicals, and reduce input costs.

Flow. In partnership with the WCSWCD and NRCS, ODA promotes irrigation water management resulting in more efficient water use and less irrigation water withdrawals. Our partners also promote sound management of riparian areas, wetlands, and other sensitive areas that contribute to stream flow during the summer months. These practices also benefit stream temperature and reduce phosphorus and nitrate loading into streams by reducing irrigation return flow to streams.

Nutrients and Organics. A variety of practices help control nutrients, bacteria, algae, and pH. ODA monitors water quality in the agricultural tributaries to detect trends and identify spikes, so outreach and technical assistance to landowners can be more effectively targeted. ODA, WCSWCD, and other partners distribute fact sheets to landowners, speak to producer groups, and meet onsite with landowners to promote nutrient management, management of manure and other potential water quality contaminants, irrigation water management, good near-stream area management, and erosion control, all of which reduce biological water quality concerns. ODA's CAFO program includes annual inspections, permit updates and reviews, complaint investigations, and locating all permitted CAFOs on GIS, all of which help prevent manure and nutrient runoff from CAFOs. ODA's Container Nursery Program controls irrigation return flow to Tualatin Basin waterways, limiting runoff of chemigated waters. In addition to benefiting water quality, these practices help landowners

Temperature. Through WCSWCD and NRCS, ODA promotes near-stream area management including riparian planting. NRCS and WCSWCD are promoting two conservation cost-sharing programs that may increase shade in near-stream areas, the Conservation Reserve Program (CRP) and the Conservation Reserve Enhancement Program (CREP). The Tualatin River Sub-Basin Local Advisory Committee recently met to review and update the Tualatin River Subbasin Agricultural Water Quality Management Area Plan (AgWQM Area Plan) to strongly encourage riparian plantings. Also, WCSWCD continues to implement the existing Area Plan, which prohibits irrigation return flow to streams. In addition to benefiting stream temperature, these practices and programs help reduce cropping on marginal lands, create riparian habitat for a variety of species, promote streambank stability, and help landowners meet their individual conservation goals.

Toxics. Through WCSWCD and NRCS, and its own educational programs, ODA promotes integrated pest management strategies and responsible application of pesticides. Integrated pest management practices, in addition to protecting water quality, help insure long-term effectiveness of pest control methods and may reduce input costs.

More information on ODA's programs for TMDL compliance is available in the February and June, 1999 reports submitted to DEQ as required in the June 1998 EQC Compliance Order.

STRATEGIES FOR MEETING FUTURE TMDLS

ODA plans to address future TMDLs through existing programs such as the Tualatin AgWQM Area Plan and its future revisions, the CAFO program, and the Container Nursery program. After DEQ publishes new TMDLs, **ODA and DEQ** will review the Tualatin Plan to evaluate its potential for achieving Load Allocations. If necessary, the Local Advisory Committee will reconvene after the review to update the Plan and rules to meet Load Allocations. If new rules are developed and adopted after an extensive public review process, ODA, WCSWCD and other partners will publicize the new rules and set goals for implementation of landowner-specific, strategies.

Below is a summary of ODA's plans for addressing TMDLs, organized by parameter. Completion of tasks by WCSWCD and NRCS is contingent on the availability of funding and personnel.

Sediment. ODA, WCSWCD and NRCS will continue outreach and education efforts to promote best management practices that reduce erosion. WCSWCD and ODA will continue cooperative efforts to implement the Tualatin AgWQM Area Plan and rules preventing erosion.

Flow. ODA, WCSWCD and NRCS will continue to promote improved irrigation water management to local agricultural producers through one-on-one site visits, workshops, articles, brochures, and tours. WCSWCD and NRCS will also provide technical assistance to producers that want to improve irrigation system efficiency.

Nutrients and Biological Parameters. ODA, WCSWCD, and NRCS will continue to promote nutrient management through one-on-one site visits, articles, and other media. ODA, WCSWCD and NRCS will promote riparian planting through education and outreach, one-on-one site visits and conservation plans, and through cost-sharing programs. ODA and WCSWCD will continue cooperative efforts to implement the Tualatin AgWQM Area Plan and rules preventing waste and nutrient runoff, sediment runoff, irrigation return flow, and bare near-stream areas during winter.

Temperature. ODA and WCSWCD will work cooperatively to implement new elements in the Tualatin AgWQM Area Plan encouraging near-stream plantings. WCSWCD and NRCS will also

work together to encourage more landowners to enroll in CRP and CREP. The LAC will update the Tualatin AgWQM Area Plan and rules if necessary after new TMDLs are published to further address temperature.

Toxics. ODA, WCSWCD and NRCS will continue to promote integrated pest management and proper storage and application of chemicals according to existing law.

ODA will continue to monitor water quality in agricultural tributaries, as well as compliance with water quality laws for agriculture, to evaluate program effectiveness and identify sites to target technical assistance. ODA and WCSWCD will adapt management strategies as necessary to meet TMDLs and the Tualatin Subbasin Nonpoint Source Management Implementation Schedule and Compliance Order.

ANTICIPATED TIMELINE FOR IMPLEMENTATION PLANS FOR NEW TMDLS

Spring 2000. DEQ releases new TMDLs. *Summer* 2000. DEQ and ODA review existing Tualatin AgWQM Area Plan to determine if the Plan provides reasonable assurance for meeting the new TMDLs.

Late fall 2000. Tualatin LAC reconvenes, if necessary, to update the Tualatin AgWQM Area Plan and Administrative Rules to meet TMDLs. *Spying* 2001. LAC completes draft Tualatin AgWQM Area Plan and Rules update.

Summer 2001. Public comment period and hearing on draft revisions to Tualatin AgWQM Area Plan and Rules. *Fall* 2001. LAC completes final Tualatin AgWQM Area Plan update and ODA files Administrative Rules.

Winter 2001 - 2003. WCSWCD, ODA, and other partners publicize revisions to Plan Rules. *Winter* 2001 - 2003. WCSWCD develops voluntary water quality farm plans to help landowners comply with the updated rules, work one-on-one with landowners to implement best management practices and if applicable, enroll in federal and local cost-sharing programs. *Winter* 2001 - 2003. CAFO and Container Nursery Program inspections ongoing. **2000-2003**. ODA conducts summer monitoring to evaluate progress toward meeting TMDLs.

The above schedule may be adjusted as necessary, depending on actual release date of new or revised TMDLs.

Appendix 3 - USA

Unified Sewerage Agency

TMDL Implementation Plan

UNIFIED SEWERAGE AGENCY OF WASHINGTON COUNTY

January 31, 2000

Rob Burkhart

Tualatin Basin Coordinator

Department of Environmental Quality - NW Region

2020 SW 4th Ave., Suite 400

Portland, OR 07210-4987

Dear Mr. Burkhart

Subject: Unified Sewerage Agency's TMDL Implementation strategies

The Designated Management Agencies (DMAs) and the Department of Environmental Quality (DEQ) have been working cooperatively to revise the existing Total Maximum Daily Loads (TMDLs) and develop anticipated new TMDLs. This letter provides the Unified Sewerage Agency's (USA) response to your memorandum to the Tualatin DMA Committee Members, dated December 10, 1999, regarding each DMA's anticipated approach to address existing and anticipated new TMDLs within each DMA's area of responsibility in the Tualatin Basin. Your letter proposed the following outline:

- A discussion of the DMA's current efforts pertaining to compliance with the existing TMDLs and any additional work being done that may address the new TMDLs. This is essentially the same as the reports that the DMAs submitted in June.
- A brief discussion and timeline for an effort to update the DMA's June report. This update would
- A brief discussion and timeline for an effort to provide implementation plans for new TMDLs.

Discussion

It is USA's understanding that the DEQ intends to include DMA-specific strategies in the appendices of a DEQ Tualatin Basin TMDL Implementation Plan. As the DMAs have indicated, the DMAs do not believe that it is appropriate to prepare a final implementation plan until after the revised and anticipated new TMDLs are final, and the EPA has adopted the final rules establishing the requirements for and elements of an implementation plan. After discussions regarding these issues between the DEQ and DMAs, USA decided, however, that it could provide the following information while the TMDLs are in the discussion draft stage.

USA's current efforts pertaining to compliance with existing TMDLs and efforts to address the anticipated new TMDLs are outlined in detail in the February and June 1999 reports which were submitted to DEQ as required by the Environmental Quality Commission (EQC). Although not implementation strategies, the February and June 1999 reports provide a comprehensive discussion of USA's compliance status with the current TMDLs and efforts to address anticipated new TMDLs. USA will continue to be in compliance with the current TMDLs through ongoing implementation of the tasks in the EQC Tualatin Basin Non-point Source Management Implementation and Compliance Schedule and Order of July 1993 (as amended June 1998). USA will also continue to address anticipated new TMDLs through Best Management Practices (BMPs) and other strategy implementation as outlined in the February and June reports.

To address the second item in your letter, it is necessary to know what the revised TMDLs are before USA can update its current program to address the revised TMDLs. The current TMDL revisions need to be near final (if not complete) before USA can initiate, develop and adopt an implementation strategy to address the revised TMDLs. The current TMDL review process has been in progress since April 1995. To date, DEQ has released only draft discussion papers on the current, and some of the anticipated new TMDLs.

The USA February and June 1999 reports outlined actions to address the anticipated new TMDLs. These actions consist largely of existing BMPs to improve water quality for the 303(d) listed parameters and other parameters. While USA will continue with these actions, it cannot develop an implementation strategy until the anticipated new TMDLs are developed.

Proposed Process

As indicated above, until the revised TMDLs and the anticipated new TMDLs are complete, USA cannot predict with any certainty what actions, if any, will be necessary to update its program to address the revised anticipated new TMDLs. However, USA expects that the following actions are among those that may need to be completed before its program can be revised to address the revised and anticipated new TMDLs:

- Legal review of TMDL requirements (1-6 months),
- Literature review for sources and control strategies (3 months),
- Technical review of the TMDL feasibility for the Tualatin Basin (9-12 months),
- Scientific review of the feasibility of meeting the water quality standards after the TMDL has been implemented (3 months),
- Consultant selection and hire (4 - 6 months),
 - Implementation strategy development with public participation (12 - 18 months),
 - Compatibility check with existing internal and external directives such as Endangered Species Act (ESA), Metro Title 3, Goal 5, Goal 6, etc. (3-4 months),
 - Governing body approval (3 months),
 - Budget development and approval with public participation (occurs between January and June each year),
 - Secure a method of financing the implementation of new or revised activities,
 - Rules and ordinance development, if necessary, with public participation and governing body approval (3-9 months),
 - Legislative action, if necessary, to provide additional authority (meets every two years).

Depending on the complexity of the TMDLs:

- The number of actions may vary.
- Some of the listed actions may be completed concurrently.
- Some of the listed actions may be done collaboratively between the DMAs and or the DMAs and the DEQ.
- The suggested timelines are estimates that may vary outside the listed ranges depending on the revised and anticipated new TMDLs.
- The outcome of the various actions will determine how USA will proceed relative to the TMDLs.

Notwithstanding the number of variables in predicting a timeline for updating its program to address the revised and anticipated new TMDLs, the overall process could take from 12 to 24 months.

Conclusion

Based on the DMA representatives' discussions with you over the past few weeks, we believe that the above description provides a reasonable response to DEQ's request as discussed in various joint DMAIDEQ meetings and in your memorandum of December 10, 1999. USA looks forward to continuing to work cooperatively with you as the DEQ proceeds with its process to revise the existing TMDLs, to develop anticipated new TMDLs, and to develop appropriate implementation plans.

Please let us know how we can provide constructive and timely input into the complex processes of TMDL revision and development, and participate in setting up a process to develop implementation plan(s) in anticipation of EPA's adoption of the final rules establishing the elements of such plans.

Sincerely.

Janice K. Miller
Water Resources Analyst

C: Jerry Linder, USA
Charles Logue, USA
Tom VanderPlaat, USA
Donna Hempstead, Multnomah County
Dave Johnson, Oregon Department of Forestry
Amin Wahab, City of Portland
Stephanie Page, Oregon Department of Agriculture
Ela Whelan, Clackamas County
Brenda Josi, City of West Linn
Andy Harris, City of Lake Oswego
Rick Raetz, Washington County
Greg Clemmons, Washington County

Appendix 4 - Portland

City of Portland

TMDL Implementation Plan

— City of PORTLAND



1120 SW Fifth Avenue, Room 1000, Portland, Oregon 97204-1912503-823-7740, FAX 503-823-6995 Dean
Marriott, Director

January 31, 2000

Rob Burkhart JAN 31 2000
Tualatin Basin Coordinator
Department of Environmental Quality - NW Region
2020 SW 4th Ave., Suite 400
Portland, OR 97201-4987
Subject: Portland's TMDL Implementation Strategies

Dear Mr. Burkhart,

The Tualatin Basin Designated Management Agencies (DMAs) and the Department of Environmental Quality (DEQ) have been working cooperatively to revise the existing Total Maximum Daily Loads (TMDLs) and develop new TMDLs. This letter is in response to your letter of December 10, 1999, regarding DMA-specific approach to address existing and anticipated new TMDLs within each DMA's area of responsibility in the Tualatin Basin. Your letter proposed the following outline:

- A discussion of the DMA's current efforts pertaining to compliance with the existing TMDLs and any additional work being done that may address the new TMDLs. This is essentially the same as the reports that the DMAs submitted in June.
- A brief discussion and timeline for an effort to update the DMA's June report. This update would be to address any revision to the existing TMDLs and/or to provide further reasonable assurance that the DMA's plan will meet the pertinent allocations. (Upon completion of the TMDLs it may be found that no update is necessary.)
- A brief discussion and timeline for an effort to provide implementation plans for new TMDLs.

Rob Burkhardt, DEQ 01/31/00 Page 2

It is Portland's understanding that the DEQ intends to include DMA-specific strategies in the appendices of a DEQ Tualatin Basin TMDL Implementation Plan that is to be submitted to the Environmental Protection Agency. As the DMAs have indicated, the DMAs do not believe that it is appropriate to prepare a final implementation plan until after the revised and anticipated new TMDLs are final, and the EPA has adopted the final rules establishing the requirements for, and the elements of, an implementation plan. After extensive discussions, the DMAs decided to provide the following information while the TMDLs are in the discussion draft stage.

Discussion

Portland's current efforts pertaining to compliance with existing TMDLs and efforts to address the new TMDLs are outlined in extensive detail in the June and February 1999 reports which were submitted to DEQ as required by the EQC. Although not implementation plans, the June and February 1999 reports provide a very comprehensive discussion of Portland's compliance status with the current TMDLs and efforts to address anticipated new TMDLs. Portland will continue to be in compliance with the current TMDLs through on-going implementation of the tasks in the EQC Tualatin Basin Non-point Source Management Implementation and Compliance Schedule and Order of July 1993 (as amended.) Portland will also continue to address new TMDLs through BMP and other strategy implementation. Again, these strategies are outlined in the June and February reports.

In order to address the second item in your letter, it is necessary to know what the revised TMDLs are before Portland can update its current program to address the revised TMDLs. The current TMDL revisions need to be near finalization (if not completion) before Portland can initiate, develop and adopt an implementation plan to address the revised TMDLs. The current TMDL review process has been in progress since April 1995. To date, DEQ has released only draft discussion papers on the current, and some of the new, TMDLs.

Portland's June and February 1999 reports also outline actions to address anticipated new TMDLs. These actions consist largely of existing BMPs to improve water quality for the 303 (d) listed parameters and other parameters. While Portland will continue with these actions, it cannot develop implementation plans until the anticipated new TMDLs are developed.

Proposed Process

As indicated above, until the revised TMDLs and the anticipated new TMDLs are complete, Portland cannot predict with any certainty what new actions, if any, will be necessary to update its programs to address the revised and anticipated new TMDLs. However, Portland expects that the following actions are among those that may need to be completed before its program can be revised to address the revised and anticipated new TMDLs:

- Legal review of TMDL requirements (1-6 months),
- Scientific review of the feasibility of meeting the water quality standards after the TMDL has been implemented (3 months),
- Literature review for sources and control strategies (3 months),
- Technical review of the TMDL feasibility for the Tualatin Basin (9-12 months),
- Consultant selection and hire (2 - 4 months),

- Implementation plan development with public participation and budget (12 – 18 months),
- Compatibility check with existing internal and external directives such as Endangered Species Act (ESA), Metro Title 3, Goal 5, Goal 6, etc. (3-4 months),
- Governing body approval and budget development (3-5 months),
- Rules and ordinance development and approval (3-9 months),
- Legislature approval to provide specific authorities (meets every two years).
-

Depending on the complexity of the TMDL:

The number of needed components may vary. Some of the listed components may be completed concurrently. Some of the listed components may be done collaboratively between the DMAs and/or the DMAs and the DEQ. The suggested timelines are estimates that may vary outside the listed ranges depending on the revised and new TMDLs. The outcome of the various steps will determine how Portland will proceed relative to the TMDLs.

Before Portland can commit to a new implementation strategy, it will be essential to first secure the necessary legal authority and funding mechanism for such a strategy. Not

Rob Burkhart, DEQ 01/31/00 Page 4

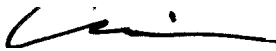
withstanding the number of variables in predicting a timeline for updating its current program to address the revised and anticipated new TMDLs, Portland does not expect this process to exceed 24 months from the date the TMDLs are complete.

Conclusion

Base on the DMA representatives' discussions with you over the past few weeks, we understand the above description provides a reasonable response to DEQ's request as discussed in various joint DMA/DEQ meetings and your memorandum of December 10, 1999. Portland will continue its cooperation with DEQ in revising the existing and developing anticipated new TMDLs, and development of appropriate implementation plans.

Please let us know how we can provide constructive and timely input into the complex processes of TMDL revision and development, and participate in setting up a process to develop implementation plan(s) in anticipation of EPA's adoption of the final rules establishing the elements of such plan.

Sincerely,



Amin Wahab
Environmental Management Division

C: Jan Betz, City Attorney's Office
Becky Kreag, BES
Dave Kliewer, BES
Patrice Mango, BES
DMAs

Appendix 5 – West Linn

City of West Linn

TMDL Implementation Plan

February 14, 2000

Rob Burkhart

Department of Environmental Quality

2020 SW 4th Ave., Suite 400

Portland, OR 97201

Dear Rob,

I am writing in response to your December 10, 1999 request for the City of West Linn's TMDL implementation plan. We are all aware that the Tualatin Basin TMDLs are presently being updated. The City's goal is to review our present strategies at the time that those updates are finalized. As per our discussion at the February 2 meeting, we expect the Phosphorous TMDL to be increased. Since our present program complies with the current TMDL, it is reasonable to assume it will also accomplish the updated levels. Chapter 5 of the February 1999 report addressed the City's bacteria and temperature management strategies. Summaries of those programs are listed below.

BACTERIA MANAGEMENT

Please refer to Chapter 5 of the *Tualatin Basin TMDL Report; February 1999* for information regarding the City's ongoing Bacteria Management Plan. As stated in that chapter, there is no waste water treatment plant in West Linn, only a sewer system. Work on a bacteria management plan primarily targets improvements to that system. For instance, a goal of the draft Comprehensive Land Use Plan (currently in the adoption process) is to "encourage existing households currently on septic systems to hook up to the City's pipe sewer system". All new development must connect to the piped system. Another improvement already accomplished is the installation of an alarm system in City pump stations within the Tualatin Basin to assure that no overflows occur.

per year at a cost of \$375,000 annually. The City employs televised inspection of sewers to detect sewer defects that have the potential of causing major sewer failures. This program is proactive in attempting to reduce the number of sewer failures due to joint failure and pipe collapse.

The City's record of sewer failures is historically low. Our consultant reports in his *Review of Existing Sewer Operation and Maintenance Procedures*, "The City of West Linn should be pleased in the performance of its sewer maintenance staff. The results of their efforts to provide proper sewer system maintenance is apparent. System failures are at a low level and will be kept at that level if the system continues to be maintained as it has in the past ten years."

TEMPERATURE MANAGEMENT

Despite a lack of guidance TMDLs for temperature, the City has taken the initiative to develop policies for Temperature Management. In aiming to decrease "view to sky", the City has adopted many ordinances in its Community Development Code to encourage the planting of trees and to discourage cutting trees. The City also has strict codes for buffer zones and planter strips. These policies are summarized in Table 2 and Chapter 5 of the *Tualatin Basin TMDL Report; February 1999*. Additional policies, goals, and action measures addressing trees and protected areas are proposed in the draft version of the Comprehensive Land Use Plan. Those policies, goals, and action measures were described earlier in this section under *Land Use Policies*.

Thank you for the encouragement you expressed to my staff at our last meeting. The City is proud of its proactive environmental approach. Please let us know when the Tualatin TMDL update is complete. If you have any questions regarding this plan or our DMA report don't hesitate to call.

Sincerely,

Dave Monson, P.E.
City Engineer

Cc: Dennis Wright, P. E.
Dennis Koellermeier
Brenda Josi

Appendix 6 – Lake Oswego

City of Lake Oswego

TMDL Implementation Plan



DEPT OF ENVIRONMENTAL QUALITY
RECEIVED

FEB 16 2000

NORTHWEST REGION

COMMUNITY DEVELOPMENT DEPARTMENT

January 31, 2000

Rob Burkhart
Tualatin Basin Coordinator
Department of Environmental Quality - NW Region
2020 SW 4th Ave., Suite 400
Portland, OR 97210-4987

Dear Mr. Burkhart

Subject: TMDL Implementation Strategies for the City of Lake Oswego

The Tualatin Basin TMDL Designated Management Agencies (DMAs) and the Department of Environmental Quality (DEQ) have been working cooperatively to revise the existing Total Maximum Daily Loads (TMDLs) and develop anticipated new TMDLs. This letter provides the City of Lake Oswego's response to your memorandum to the Tualatin DMA Committee Members, dated December 10, 1999, regarding each DMA's anticipated approach to address existing and anticipated new TMDLs within each DMA's area of responsibility in the Tualatin Basin. Your letter proposed the following outline:

A discussion of the DMA's current efforts pertaining to compliance with the existing TMDLs and any additional work being done that may address the new TMDLs- This is essentially the same as the reports that the DMAs submitted in June.

A brief discussion and timeline for an effort to update the DMA's June report. This update would be to address any revision to the existing TMDLs and/or to provide further reasonable assurance that the DMA's plan will meet the pertinent allocations. (Upon completion of the TMDLs it may be found that no update is necessary.)

A brief discussion and timeline for an effort to provide implementation plans for new TMDLs.

Discussion

The City of Lake Oswego understands that the DEQ intends to include DMA-specific strategies in the appendices of a DEQ Tualatin Basin TMDL Implementation Plan. As the DMAs have indicated, the DMAs do not believe that it is appropriate to prepare a final implementation plan until after the revised and anticipated new TMDLs are final, and the EPA has adopted the final rules establishing the requirements for, and elements of, an implementation plan. After discussions, the DMAs decided to provide the following information while the TMDLs are in the discussion draft stage.

The City of Lake Oswego's current efforts pertaining to compliance with existing TMDLs and efforts to address the anticipated new TMDLs are outlined in detail in the February and June 1999 reports which were submitted to DEQ as required by the Environmental Quality Commission (EQC). Although not implementation strategies, the February and June 1999 reports provide a comprehensive discussion of the Lake Oswego's compliance status with the current TMDLs and efforts to address anticipated new TMDLs. Lake Oswego will continue to be in compliance with the current TMDLs through ongoing implementation of the tasks in the EQC Tualatin Basin Non-point Source Management Implementation and Compliance Schedule and Order of July 1993 (as amended June 1998). Lake Oswego will also continue to address anticipated new TMDLs through Best Management Practices (BMPs) and other strategy implementation as outlined in the February and June reports.

To address the second item in your letter, it is necessary to know what the revised TMDLs are before Lake Oswego can update its current program to address the revised TMDLs. The current TMDL revisions need to be near final (if not complete) before Lake Oswego can initiate, develop and adopt an implementation strategy to address the revised TMDLs. The current TMDL review process has been in progress since April 1995. To date, DEQ has released only draft discussion papers on the current, and some of the anticipated new TMDLs.

The City of Lake Oswego February and June 1999 reports outlined actions to address the anticipated new TMDLs. These actions consist largely of existing BMPs to improve water quality for the 303(d) listed parameters and other parameters. While Lake Oswego will continue with these actions, it cannot develop an implementation strategy until the anticipated new TMDLs are developed.

As indicated above, until the revised TMDLs and the anticipated new TMDLs are complete, Lake Oswego cannot predict with any certainty what actions, if any, will be necessary to update its program to address the revised anticipated new TMDLs. However, Lake Oswego expects that the following actions be among those that may need to be completed before its program can be revised to address the revised and anticipated new TMDLs:

- Legal review of TMDL requirements (1-6 months),
- Literature review for sources and control strategies (3 months),
- Technical review of the TMDL feasibility for the Tualatin Basin (9-12 months),
- Scientific review of the feasibility of meeting the water quality standards after Consultant selection and hire (4 - 6 months)
- Implementation strategy development with public participation (12 - 18 months), Compatibility check with existing internal and external directives such as Endangered Species Act (ESA), Metro Title 3, Goal 5, Goal 6, etc. (3-4 months),
- Governing body approval (3 months), Budget development and approval with public participation (occurs between January and June each year), Secure a method of financing the implementation of new or revised activities, Rules and ordinance development, if necessary, with public participation and governing body approval (3-9 months), Legislative action, if necessary, to provide additional authority (meets every two years).

Depending on the complexity of the TMDLs:

The number of actions may vary.

Some of the listed actions may be completed concurrently. Some of the listed actions may be done collaboratively between the DMAs and/or the DMAs and the DEQ.

The suggested timelines are estimates that may vary outside the listed ranges depending on the revised and anticipated new TMDLs.

The outcome of the various actions will determine how Lake Oswego will proceed relative to the TMDLs.

Notwithstanding the number of variables in predicting a timeline for updating its program to address the revised and anticipated new TMDLs, the overall process could take from 12 to 24 months..

Conclusion

Based on the DMA representatives' discussions with you over the past few weeks, we believe that the above description provides a reasonable response to DEQ's request as discussed in various joint DMA/DEQ meetings and in your memorandum of December 10, 1999. Lake Oswego looks forward to continuing to work cooperatively with you as the DEQ proceeds with its process to revise the existing TMDLs, to develop anticipated new TMDLs, and to develop appropriate implementation plans.

Please let us know how we can provide constructive and timely input into the complex processes of TMDL revision and development, and participate in setting up a process to develop implementation plan(s) in anticipation of EPA's adoption of the final rules establishing the elements of such plans.

Sincerely,

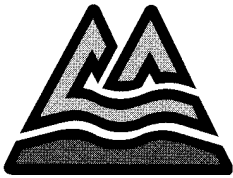
Andrew J. Harris
Surface Water Management Specialist

C: Mark Schoening, City Engineer
David Powell, City Attorney
Joel Komarek, Assistant City Engineer
Jan - ice - K. Miller, USA
Donna Hempstead, Multnomah County
Dave Johnson, Oregon Department of Forestry
Amin Wahab, City of Portland
Stephanie Page, Oregon Department of Agriculture
Ela Whelan, Clackamas County
Brenda Josi, City of West Linn
Rick Raetz, Washington County
Greg Clemmons, Washington County

Appendix 7 – Multnomah County

Multnomah County

TMDL Implementation Plan



Multnomah County Oregon

DEPARTMENT OF ENVIRONMENTAL
SERVICES
1600 SE 190TH
PORTLAND, OREGON 97233
(503) 348-5000

BOARD OF COUNTY COMMISSIONERS

BEVERLY STEIN - CHAIR OF THE BOARD

DIANE LINN - DISTRICT 1 COMMISSIONER

SERENA CRUZ - DISTRICT 2 COMMISSIONER

January 31, 2000

Rob Burkhardt, Tualatin Basmi Coordinator Water Quality
Division Department of Environmental Quality - NW Region
2020 SW 4th Ave., Suite 400 Portland, OR 97210-4987

DEPT OF ENVIRONMENTAL QUALITY
PORTLAND

Dear Mr Burkhardt:

The Designated Management Agencies (DMAs) and the Department of Environmental Quality (DEQ) have been working cooperatively to revise the existing Total Maximum Daily Loads (TMDLs) and to develop new TMDLs relating to the Tualatin River Basin. This letter provides Multnomah County's response to your memorandum to the Tualatin DMA Committee Members, dated December 10, 1999, regarding each DMA's anticipated approach to addressing existing and future TMDLs within each DMA's area of responsibility in the Tualatin basin. Your memorandum proposed the following outline:

- A discussion of the DMA's current efforts pertaining to compliance with the existing TMDLs and any additional work being done that may address the new TMDLs. This is essentially the same as the reports that the DMAs submitted 'in June ('June reports').
- A brief discussion and timeline for an effort to update the DMA's June report. This update would be to address any revision to the existing TMDLs and/or to provide further reasonable assurance that the DMA's plan will meet the pertinent allocations. (Upon completion of the TMDLs it may be found that no update is necessary.)

A brief discussion and timeline for an effort to provide implementation plans for new TMDLs."

Discussion

We understand that the DEQ intends to include DMA-specific strategies *in the appendices of a DEQ Tualatin Basin TMDL implementation Plan. As the DMAs have indicated, the DMAs do not believe that it is appropriate to prepare a final implementation plan until after the revised and new TMDLs are final, and the EPA has adopted the final rules establishing the I

requirements for and elements of an implementation plan. After discussions regarding these issues between the DEQ and the DMAs, Multnomah County decided is able to provide the following information while the TMDLs are in the discussion draft stage.

Multnomah County's current program pertaining to compliance with existing TMDLs are outlined in detail in the February and June 1999 reports which Multnomah County submitted to DEQ. Chapter 5 of the June report demonstrates general strategies to address the future new TMDLs, some of which are currently practiced and some of which will need program enhancement. Although not implementation strategies, the February and June 1999 reports provide a comprehensive discussion of Multnomah County's compliance with the existing TMDLs and its efforts to address the anticipated new TMDLs. Multnomah County will continue to comply with the existing TMDLs through on-going implementation of the tasks in the Environmental Quality Commission's Tualatin Basin Non-Point Source Management Implementation and Compliance Schedule and Order of July 1993 (as amended.) Multnomah County will also continue to address the anticipated TMDLs through BMPs and other strategy implementation as outlined in the February and June reports.

To address the second item in your letter, it is necessary to know what the final revised TMDLs are before Multnomah County can update its current program to address the revised TMDLs and to provide any "further reasonable assurance" to the extent required under the final EPA rules regarding TMDLs. The current TMDL review process has been in progress since April 1995. The Technical Advisory Committee (TAC) and Policy Advisory Committee (PAC) recommended revisions to the phosphorus and ammonia TMDLs (existing). Their reports and draft discussion papers on the current, and some of the new, TMDLs are available. At a minimum, the current TMDL revisions need to be near final (if not complete) before Multnomah County can initiate, develop and adopt an implementation strategy to address the revised TMDLs.

Multnomah County's February and June 1999 reports outline current actions to address the anticipated new TMDLs. These actions consist largely of existing BMPs to improve water quality for the 303 (d) listed parameters and other parameters. While Multnomah County will continue with these actions, it cannot develop an implementation strategy until the new TMDLs are developed.

Proposed Process

As indicated above, until the revised TMDLs and the anticipated new TMDLs are final, Multnomah County cannot predict with any certainty what actions, if any, will be necessary to update its program to address the revised and new TMDLs. However, Multnomah County expects that the following actions are among those that may need to be completed before its program can be revised to address any final revised and new TMDLs:

- Further technical review and agreement of the TMDL attainability for the Tualatin Basin;
- Scientific review of the feasibility of meeting the water quality standards after the TMDL has been implemented;
- Legal review of TMDL requirements, County authority and implementation strategy/plan development;

Implementation strategy/plan development with public participation;
Budget development with public participation;
Governing body program approval and budget approval;
Rules and ordinance development, if necessary, with public participation and governing body approval; and
Legislative action, if necessary, to provide specific authorities to County activity.

The actions that Multnomah County must take to update its program to address final revised and new TMDLs likely will vary depending upon the actual TMDL and TMDL revisions. At a minimum, however, to commit to and implement new or revised program elements Multnomah County must first ensure that it has or obtains the necessary legal authority, and also ensure that it has an approved budget and secures a method of financing the implementation of any new or revised activities.

Notwithstanding the number of variables in predicting a timeline for updating its program to address final revised and new TMDLs, Multnomah County does not expect this process to exceed 24 months from the date the TMDLs are made final.

Conclusion

Based on the DMA representatives' discussions with you over the past few weeks, we understand that the above description provides a reasonable response to DEQ's request as discussed in various joint DMA/DEQ meetings and in your memorandum of December 10, 1999. Multnomah County looks forward to continuing to work cooperatively with you as the DEQ proceeds with its process to revise the existing TMDLs, to develop new TMDLs, and to develop appropriate implementation plans.

Please let us know how we can provide constructive and timely input into the complex processes of TMDL revision and development, and also participate in setting up a process to develop implementation plan(s) in anticipation of EPA's adoption of the final rules establishing the elements of such plans.

Sincerely,



LARRY NICHOLAS, P.E.
DIRECTOR,
Department of Environmental

Appendix 8 – Clackamas County

Clackamas County

TMDL Implementation Plan



WATER ENVIRONMENT

Water Quality Protection - Surface Water Management Wastewater Collection and Treatment January 31, 2000

Rob Burkhardt
Tualatin Basin Coordinator
Department of Environmental Quality - NW Region -
2020 SW 4th Ave., Suite 400
Portland, OR 97210-4987

ENVIRONMENTAL QUALITY
RECEIVED

Dear Mr. Burkhardt:

The Designated Management Agencies (DMAs) and the Department of Environmental Quality (DEQ) have been working cooperatively to revise the existing Total Maximum Daily Loads (TMDLs) and to develop new TMDLs relating to the Tualatin River basin. This letter provides Surface Water Management Agency of Clackamas County's (SWMACC's) response to your memorandum to the Tualatin DMA Committee Members, dated December 10, 1999, regarding each DMA's anticipated approach to address existing and future TMDLs within each DMA's area of responsibility in the Tualatin basin. Your memorandum proposed the following outline:

A discussion of the DMA's current efforts pertaining to compliance with the existing TMDLs and any additional work being done that may address the new TMDLs. This is essentially the same as the reports that the DMAs submitted in June ('June reports').

A brief discussion and timeline for an effort to update the DMA's June report. This update would be to address any revision to the existing TMDLs and/or to provide further reasonable assurance that the DMA's plan will meet the pertinent allocations. (Upon completion of the TMDLs it may be found that no update is necessary.)

Discussion

It is SWMACC's understanding that the DEQ intends to include DMA-specific strategies in the appendices of a DEQ Tualatin Basin TMDL Implementation Plan. As the DMAs have indicated, the DMAs do not believe that it is appropriate to prepare a final implementation plan until after the revised and new TMDLs are final, and the EPA has adopted the final rules establishing the requirements for and elements of an implementation plan. After discussions regarding these issues between the DEQ and DMAs, SWMACC decided, however, that it could provide the following information while the TMDLs are in the discussion draft stage.

SWMACC's current efforts pertaining to compliance with existing TMDLs, and efforts to address the anticipated new TMDLs, are outlined in detail in the February and June 1999 reports which SWMACC submitted to DEQ. Although not implementation strategies, the February and June 1999 reports provide a comprehensive discussion of SWMACC's compliance with the existing TMDLs and its efforts to address the anticipated new TMDLs. SWMACC will continue to comply with the existing TMDLs through on-going implementation of the tasks in the Environmental Quality Commission's Tualatin Basin Non-Point Source Management Implementation and Compliance Schedule and Order of July 1993 (as amended.) SWMACC will address the anticipated TMDLs through BMPs and other strategy implementation as outlined in the February and June reports.

To address the second item in your letter, it is necessary to know what the final revised TMDLs are before SWMACC can update its current program to address the revised TMDLs and to provide any "further reasonable assurance" to the extent required under the final EPA rules regarding TMDLs. At a minimum, the current TMDL revisions need to be near final (if not complete) before SWMACC can initiate, develop and adopt an implementation strategy to address the revised TMDLs. The current TMDL review process has been in progress since April 1995, and only draft discussion papers on the current, and some of the new, TMDLs are available.

SWMACC's February and June 1999 reports outline current actions to address the anticipated new TMDLs. These actions consist largely of existing BMPs to improve water quality for the 303 (d) listed parameters and other parameters. While SWMACC will continue with these actions, it cannot develop an implementation strategy until the new TMDLs are developed.

Proposed Process

As indicated above, until the revised TMDLs and the anticipated new TMDLs are final, SWMACC cannot predict with any certainty what actions, if any, will be

necessary to update its program to address the revised and new TMDLs. However, SWMACC expects that the following actions are among those that may need to be completed before its program can be revised to address any final revised and new TMDLs:

- Literature review for sources and control strategies;
- Technical review of the TMDL feasibility for the Tualatin Basin;
- Scientific review of the feasibility of meeting the water quality standards after the TMDL has been implemented;
- Legal review of TMDL requirements, County authority and implementation strategy/plan development;
- Implementation strategy/plan development with public participation;
- Budget development with public participation;
- Governing body program approval and budget approval;
- Rules and ordinance development, if necessary, with public participation and governing body approval; and
- Legislative action, if necessary, to provide specific authorities.

The actions that SWMACC must take to update its program to address final revised and new TMDLs likely will vary depending upon the actual TMDL and TMDL revisions. At a minimum, however, to commit to and implement new or revised program elements SWMACC must first ensure that it has or obtains the necessary legal authority, and also ensure that it has an approved budget and secures a method of financing the implementation of any new or revised activities.

Notwithstanding the number of variables in predicting a timeline for updating its program to address final revised and new TMDLs, SWMACC does not expect this process to exceed 24 months from the date the TMDLs are made final.

Conclusion

Based on the DMA representatives' discussions with you over the past few weeks, we understand that the above description provides a reasonable response to DEQ's request as discussed in various joint DMA/DEQ meetings and in your memorandum of December 10, 1999. SWMACC, looks forward to continuing to work cooperatively with you as the DEQ proceeds with its process to revise the existing TMDLs, to develop new TMDLs, and to develop appropriate implementation plans.

Please let us know how we can provide constructive and timely input into the

complex processes of TMDL revision and development, and also participate in setting up a process to develop implementation plan(s) in anticipation of EPA's adoption of the final rules establishing the elements of such plans.

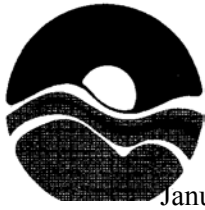
Sincerely,

J. Michael
Read

Appendix 9 – Washington County

Washington County

TMDL Implementation Plan



WASHINGTON

COUNTY,

January 31, 2000

DEPT OF ENVIRONMENTAL QUALITY
RECEIVED

FEB 01 2000

Mr. Rob Burkhart
Tualatin Basin Coordinator
NW Region, Department of Environmental Quality
2020 SW 4th Ave., Suite 400

NORTHWEST REGION

RE: TUALATIN BASIN TMDL IMPLEMENTATION STRATEGIES

Dear Mr. Burkhart:

The Designated Management Agencies (DMAs) and the Department of Environmental Quality (DEQ) have been working cooperatively to revise the existing phosphorus Total Maximum Daily Loads (TMDLs) and to develop new TMDLs relating to the Tualatin River Basin. This letter provides Washington County's response to your memorandum to the Tualatin DMA Committee, dated December 10, 1999, regarding each DMA's suggested approach to address existing and future TMDLs within each DMA's area of responsibility in the Tualatin Basin. Your memorandum proposed the following outline:

- A discussion of the DMA's current efforts pertaining to compliance with the existing TMDLs and any additional work being done that may address the new TMDLs. This is essentially the same as the reports that the DMAs submitted in June ('June reports').
- A brief discussion and timeline for an effort to update the DMA's June report. This update would be to address any revision to the existing TMDLs and/or to provide further reasonable assurance that the DMA's plan will meet the pertinent allocations. (Upon completion of the TMDLs it may be found that no update is necessary.)
- A brief discussion and timeline for an effort to provide implementation plans for new TMDLs."

Discussion

It is our understanding that the DEQ would like to include DMA-specific strategies in the appendices of a DEQ Tualatin Basin TMDL Implementation Plan. As the DMAs have indicated, the DMAs do not believe that it is appropriate to prepare an implementation plan until after the revised and new TMDLs are final, and the EPA has adopted the final rules establishing the requirements for and elements of an implementation plan. After discussions regarding these issues between the DEQ and DMAs, Washington County decided that it could provide the following information while the TMDLs are in the discussion draft stage.

ROB BURKHART

January 31, 2000

Page 2

Washington County's current efforts pertaining to compliance with existing TMDLs, and efforts to address the anticipated new TMDLs, are outlined in detail in the February and June 1999 reports which Washington County submitted to DEQ. Although not implementation strategies, the February and June 1999 reports provide a comprehensive discussion of the County's compliance with the existing TMDLs and efforts to address the anticipated new TMDLs. Washington County will continue to comply with the existing TMDLs through ongoing implementation of the tasks in the Environmental Quality Commission's (EQC's) Tualatin Basin Non-Point Source Management Implementation and Compliance Schedule and Order of July 1993 (as amended in 1998.) Washington County will continue to address the anticipated TMDLs through Best Management Practices (BMPs) and other strategy implementation as outlined in the February and June reports.

To address the second item in your letter, it is necessary to know what the final revised TMDLs are before Washington County can update its current program to address the revised TMDLs, if necessary, and to provide any "further reasonable assurance" to the extent required under the final EPA rules regarding TMDLs. The current TMDL revisions need to be near final before Washington County can initiate, develop and adopt an implementation strategy to address the revised TMDLs. The current TMDL review process has been in progress since April 1995, and only draft discussion papers on the current, and some of the new, TMDLs are available.

Section 5 of Washington County's June 1999 submittal outlines current actions to address the anticipated new TMDLs. These actions consist largely of existing BMPs to improve water quality for the 303 (d) listed parameters and other parameters. While the County will continue with these actions, it cannot develop an implementation strategy until the new TMDLs are developed.

Proposed Process As indicated above, until the revised TMDLs and the anticipated new TMDLs are final, Washington County cannot predict with any certainty what actions, if any, will be necessary to update its program to address the revised and new TMDLs. However, it is expected that the following actions are among those that may need to be completed before its program can be revised to address any final revised and new TMDLs:

Literature review for sources and control strategies; Technical review of the TMDL feasibility for the Tualatin Basin; Scientific review of the feasibility of meeting the water quality standards after the TMDL has been implemented; Legal review of TMDL requirements, County authority and implementation strategy/plan development;

ROB BURKHART

January 31, 2000

Page 3

Implementation strategy/plan development with public participation; Budget development with public participation; Governing body program approval and budget approval; Rules and ordinance development, if necessary, with public participation and governing body approval; and Legislative action, if necessary, to provide specific authorities to County activity that does not currently exist.

The actions that the County must take to update its program to address final revised and new TMDLs likely will vary depending upon the actual TMDL and TMDL -revisions. Notwithstanding the number of variables in predicting a timeline for updating its program to address final revised and new TMDLs, the DMAs do not expect this process to exceed 24 months from the date the TMDLs are made final.

Conclusion

Based on the DMA representatives' discussions with you over the past few weeks, we understand that the above description provides a reasonable response to DEQ's request as discussed in various joint DMA/DEQ meetings and in your memorandum of December 10, 1999. We look forward to continuing to work cooperatively with you as the DEQ proceeds with its process to revise the existing TMDLs, to develop new TMDLs, and to develop appropriate implementation plans.

Sincerely,

John Rosenberger
Director

JR,jw-b

c: Greg..M Iler
Greg Clemmons
Rick Raetz
c/file